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ENDANGERED AND UNIQUE FISH AND WILDLIFE
OF THE
SOUTHWESTERN NATIONAL FORESTS

WILDLIFE HABITAT MANAGEMENT STAFF GROUP

1975

U. S. DEPARTMENT OF AGRICULTURE-FOREST SERVICE
SOUTHWESTERN REGION

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INTRODUCTION

The National Forests of the Southwestern Region contain important habitat for many fish and wildlife species. One of the major responsibilities of the Forest Service is to protect and where necessary improve this habitat.

Through cooperative relations with State Game and Fish Departments and the U. S. Fish and Wildlife Service, the Forest Service has strengthened its habitat management programs to include all wildlife on the National Forests. By identifying and maintaining a healthy habitat needed by unique, threatened, or endangered fauna, the Forest Service can contribute much to their well-being and preservation. While the Forest Service is concerned with preservation of individual animal species, it is even more concerned with creating a hospitable environment for the entire biological complex. If species disappear, a less diversified and therefore a less desirable ecosystem results. The Forest Service goal is to preserve as widely varied biota as possible, representing the largest number of species adapted to all habitat situations.

The list of endangered and unique species requires constant monitoring. The list changes as additional species become threatened and as previously threatened species are restored through improved habitat management. This list is compiled as an action program--one to stimulate action that will, wherever possible, insure survival.

The Southwestern Region of the Forest Service has many unique species and a few which are endangered. Because of this rich heritage of wildlife, the Forest Service is emphasizing preservation of the habitat needed to retain these species in our Nation's fauna. This report has been prepared to aid in this urgent challenge.

W. D. Hurst

REGIONAL FORESTER
Southwestern Region

CLASSIFICATION AND TERMINOLOGY

Four terms, "Endangered, Rare, Peripheral and Status Undertermined," were employed in 1967 to provide a basis for classifying rare and endangered fish and wildlife. Evolution of the program has brought changes in terminology and caused some confusion. To avoid further misunderstanding, only those species or subspecies included in the list of endangered wildlife published in the Federal Register as amended on June 4, 1973, are designated "endangered." All other species which are of special interest, for whatever reason, are designated "unique." The Forest Service "unique" category is defined as a species which is not endangered, but may have considerable scientific, local or national interest.

Several other terms are used to state the relative abundance of a given species, particularly birds, within its range or habitat type are defined as follows: abundant -- in numbers; common -- always to be seen, but not in large numbers; fairly common -- very small numbers or not always seen; uncommon -- seldom seen, but not a surprise; rare -- always a surprise, but not out of normal range; occasional -- occurring infrequently (e.g. one record in 5 years); casual -- occurring very infrequently (recorded once every ten years or less); accidental -- far from normal range and not expected again.

The species and subspecies of endangered fish and wildlife listed in the report were compiled from those species entered in the 1973 revised edition of the "Redbook" as being native or seasonal residents to National Forest lands within the Southwestern Region. Status classification for these species is that afforded it by the Endangered Species Act. The unique species listed are included for the reasons stated in the comments under "Status:" in each individual data summary. An attempt was made to list primary management considerations for each species to aid Forest in planning and conducting on-the-ground habitat management programs. These considerations are not meant as the only ones to be used in formulating plans but hopefully will serve as guidelines for developing new coordinating benefits. The Forest Multiple Use Area Guide, as always, should be consulted for all Forest planning. Forests are urged to review all unique and endangered species that follow, and develop managment units for the enhancement of those species found on their Forests.

The New Mexico Game and Fish Commission by adoption of regulation No. 563 listed 26 animals as Endangered and whose prospects of survival or recruitment in New Mexico are in jeopardy (Group I). Thirty-three animals are listed as Endangered and whose prospects of survival or recruitment with the state are likely to be in jeopardy within the foreseeable future. (Group II)

In this booklet the state status is shown as either "Group I New Mexico," or "Group II New Mexico."

FOREWORD

The material presented in this booklet is intended to serve as a quick handy reference for field personnel in determining the status, possible presence, identification, habitat needs, and recommended management for fish and wildlife which are classified as endangered or unique. The information has purposely been kept brief, and in most cases fairly general. As individual wildlife species listed in this guide are found in your particular area more detailed information on habitat needs, plus other information, can be obtained from technical publications. Should additional information be lacking, it is important that notes of observations be kept for future reference. We suggest using the back of the data sheets for this purpose. Copies of these notes should be sent to the Forest Supervisor's and Regional Office along with the annual wildlife report, so that this important data can be made available to others.

Separate data sheets are included for 43 individual species or subspecies, of which 12 are included in the official list of endangered native fish and wildlife, as amended October 1973. The remaining 33, plus an additional 21 which are grouped by habitat type, are not necessarily threatened, but fall within the classification of unique as defined by direction from the office of the Chief. i.e., They are not classified as endangered, but have considerable local, scientific or national interest. Some of these are "threatened" as classified in the current (1973) issue of the "Redbook," Threatened Wildlife of the United States, published by the U. S. Department of the Interior, U. S. Fish and Wildlife Service. Others have been designated "unique" for reasons as stated on the individual species data sheets. Peripheral species are included here which are not endangered or threatened with extinction within the major portion of their normal range, but which are of interest because they occur more or less regularly, and in some instances nest or reproduce on National Forest lands. Many are of considerable interest because their appearance on the National Forest in this Region frequently represents the extreme limit of their range. For this reason we should not only be aware of them and their habitat requirements, but should consider their needs in all management and project proposals. By protecting the habitat and encouraging its occupation by peripheral species, we may actually contribute to extending the natural range of these species. In this way perhaps we can remove some of the threat of extinction to these and other species which make use of the same types of habitat.

You will note that data sheets for each endangered species are printed on salmon colored paper to facilitate rapid location of data on the particular species. The location maps are intended to give general locations where particular species may be expected to occur, but are not exact representations of known ranges based on collections of museum specimens. Most species included in this publication are protected by both Federal and State law.

✓ Management units will be established for each species or group of species on National Forest Lands.

From time to time, as various wildlife populations fluctuate, research findings become available, and regulatory legislation is developed or changed, it may become necessary to amend, withdraw or add to the material herein. You may find it useful to insert local data which will make this booklet more useful in your own particular area. Feel free to do so. This is intended to be a working tool, and it will be helpful only to the extent you find ways to use it in day to day administration.

Appreciation is expressed to Ross L. Teuber, Henry J. McKirdy and Donald A. Duff who assembled this information. A special thanks is also extended to the Game and Fish Departments of Arizona and New Mexico, the USF&WS, BLM, University and lay people without who's help this printing would not be possible. The final assembly of the booklet has been a combined effort, including the assistance of Win Green, Carson National Forest, many people in the Regional Office and especially the Wildlife Management Staff. ✓

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Lesser Prairie Chicken	White-tailed Ptarmigan
Mountain Plover	Snowy Plover
Spotted Owl	Borrowing Owl
Whiskered Owl	Elf Owl
Ferruginous Owl	Ridgway's Whip-poor-will
Anna's Hummingbird	Costa's Hummingbird
Lucifer Hummingbird	Rivoli's Hummingbird
Blue-throated Hummingbird	Violet-crowned Hummingbird
Broad-billed Hummingbird	White-eared Hummingbird
Coppery-tailed Trogon	Red-headed Woodpecker
Northern Three-toed Woodpecker	Rose-throated Becard
Sulphur-bellied Flycatcher	Tropical Kingbird
Thick-billed Kingbird	Buff-breasted Flycatcher
Beardless Flycatcher	Cave Swallow
Varied Bunting	Grasshopper Sparrow
Rufous-winged Sparrow	Botteri's Sparrow
Green Kingfisher	Azure Eastern Bluebird

MAMMALS

Allen Big-eared Bat	Marten
Otter	Kit Fox
Jaquar	Black-tailed Prairie Dog
Kaibab Squirrel	Arizona Gray Squirrel
Long-tailed Vole	Antelope Jackrabbit
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Little Colorado River Spinedace

Sonora Chub
Loach Minnow
Yaqui Sucker
Bonytail Chub
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Humpback Chub

Colorado River Squawfish

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Sacramento Mountain Salamander
Greater Earless Lizard
Gila Monster

Desert Tortoise
Chichuahua Whiptail

We wish to extend a hearty thanks to the following individuals who furnished us with photographs and specimens:

Dave Brown, Small Game Supervisor
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Mr. Brown provided us with photos of the Hooded Skunk and Apache Squirrel from museum specimens from the University of Arizona.

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Win Green, Forest Wildlife Biologist
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Win provided us with a Rio Grande Cutthroat specimen which we photographed.

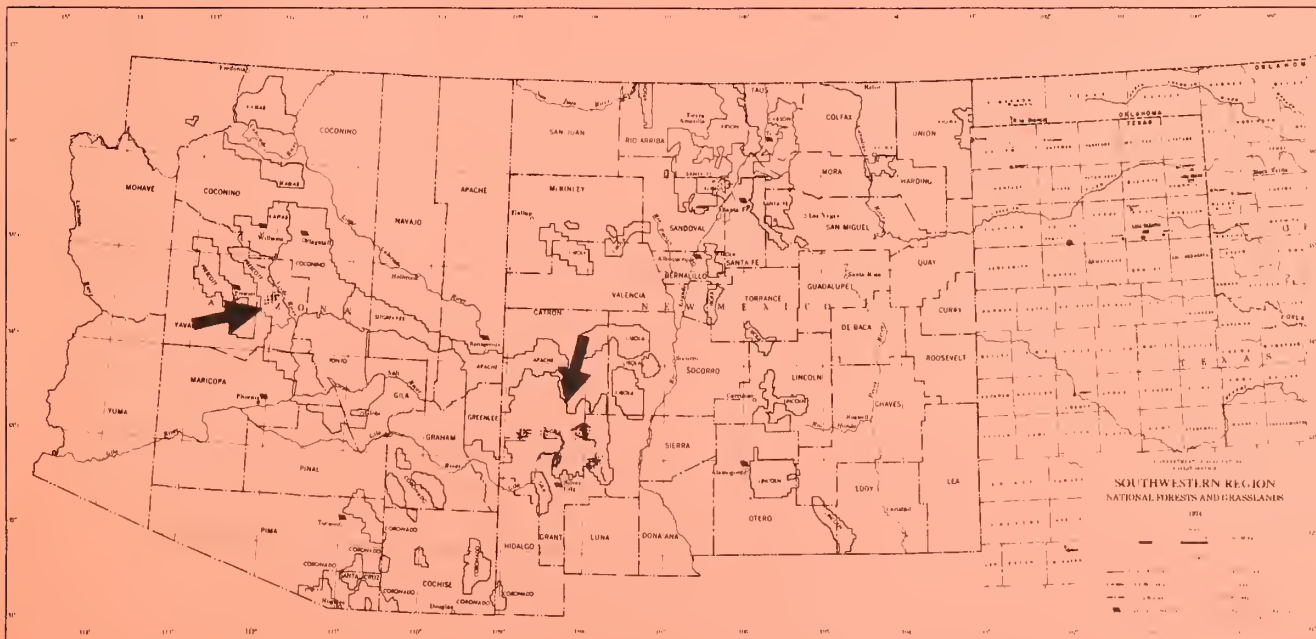
All of the forementioned texts are excellent research and reference books. Each Forest Unit should have these books available for their reference. Each Forest Biologist and other field personnel should also own personal copies of these texts to aid in identification of these species.

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GILA TROUT

Salmo gilae (Miller)STATUS: Endangered, (Group I, New Mexico)REGIONAL DISTRIBUTION: Gila National Forest, Prescott National Forest

A native fish which presently occurs naturally in only four drainages on the headwaters of the Gila River system. These are Main Diamond, South Diamond, McKenna and Spruce Creeks. It has been transplanted into McKnight and Sheep Corral Creeks, Gila National Forest and Gap Creek, Prescott National Forest. This fish formally was found throughout the Upper Gila system and in many tributaries to the Verde system in Arizona.



HABITAT TYPE ASSOCIATION: The habitat includes cool, flowing streams lined with riparian vegetation such as alder, cottonwood, and mixed conifer. These streams are protected by barriers such as waterfalls from invasion by introduced fish species.

DISTINGUISHING CHARACTERISTICS: The best identifying characteristic of this species is the extremely fine and profuse spotting on the dorsal and caudal fins, and upper portion of the body above the lateral line. The adipose fin is unusually large compared with the rainbow trout, and well spotted. The color varies from golden brown on the back, through golden yellow sides and is much lighter on the undersides. A rose-red lateral band is often present. The pectoral and pelvic fins are usually white on the outer edge. Adults have a yellowish "cutthroat" mark.

REPRODUCTION: Spawning is thought to take place in late May or early June. Young have been observed in shallow, protected areas throughout the summer.

NUMBER OF YOUNG: Limited research found an average of only 75.6 eggs per female in one case and 150 eggs per female in another case. This is quite low in comparison with other trout species.

FOOD HABITS: Gila trout feed primarily on insects and insect larvae. The volume of different types varies with change of season and abundance of different kinds. The preferred insect orders are Trichoptera (caddis flies), Ephemeroptera (mayflies), and Plecoptera (Stone flies). Some observations indicate Gila trout have a strong "pecking order," which permits a single fish, usually the largest, to dominate the feeding in a given pool.

HAZARDS TO THE SPECIES: One of the biggest hazards to maintaining a pure strain of the Gila trout is the readiness with which they hybridize with introduced rainbows. Because of the limited habitat in which these fish occur and the restrictions on fishing, there is a tendency for them to become overcrowded and therefore stunted in growth. Another hazard is their natural lack of shyness and the ease with which they may be caught.

HABITAT REQUIREMENTS: The main habitat requirement over and above what is needed for all trout fisheries is an adequate arrangement of physical barriers in the stream channel to prevent upstream migration of introduced rainbows.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Cooperative interagency studies by the New Mexico Department of Game and Fish, US Fish and Wildlife Service, New Mexico State University and the Forest Service to determine the life history of the Gila trout.
2. Installation of stream improvement structures.
3. Discontinuance of the issuance of scientific collectors permits for Gila trout.

4. Discontinuance of the stocking of exotic fish species (i.e., rainbow trout) in known Gila trout waters.

5. Introduction of Gila trout into additional suitable streams in Arizona and New Mexico.

6. The establishment of a breeding stock of Gila trout at Glenwood Hatchery in New Mexico and Sterling Springs Hatchery in Arizona.

7. The approval of a Gila trout habitat management plan by the Gila National Forest.

8. The regulation of livestock grazing in riparian areas along the streams containing Gila trout populations.

9. The establishment of a Gila Trout Recovery Team by the U.S. Fish and Wildlife Service.

10. An active I&E program to alert the public to the status of the Gila trout.

MANAGEMENT PROPOSALS:

1. Implement the management direction contained in the approved habitat management plan.

2. Continue to cooperate in interagency studies to determine life history requirements and restoration needs.

3. Continue to cooperate with New Mexico and Arizona departments of game and fish to protect and preserve this species and its habitat.

4. Evaluate thoroughly all presently proposed and future active mining operations and claim staking to prevent possible degradation of the habitat caused by soil erosion, stream sedimentation and reduction in water quality and quantity.

5. Continue to stock additional fish in those streams suited for Gila trout. Stock Gila trout in one of the larger suitable streams to provide for maximum growth. The present program, with continuing effort, should provide for a limited Gila trout fishery in a very few years. This could be a very demanding wilderness type of fishery due to the remoteness of the streams. Keep creel limit down, at least initially. Forest should consider a creel census project in cooperation with the New Mexico Game and Fish Department at time of public fishing.

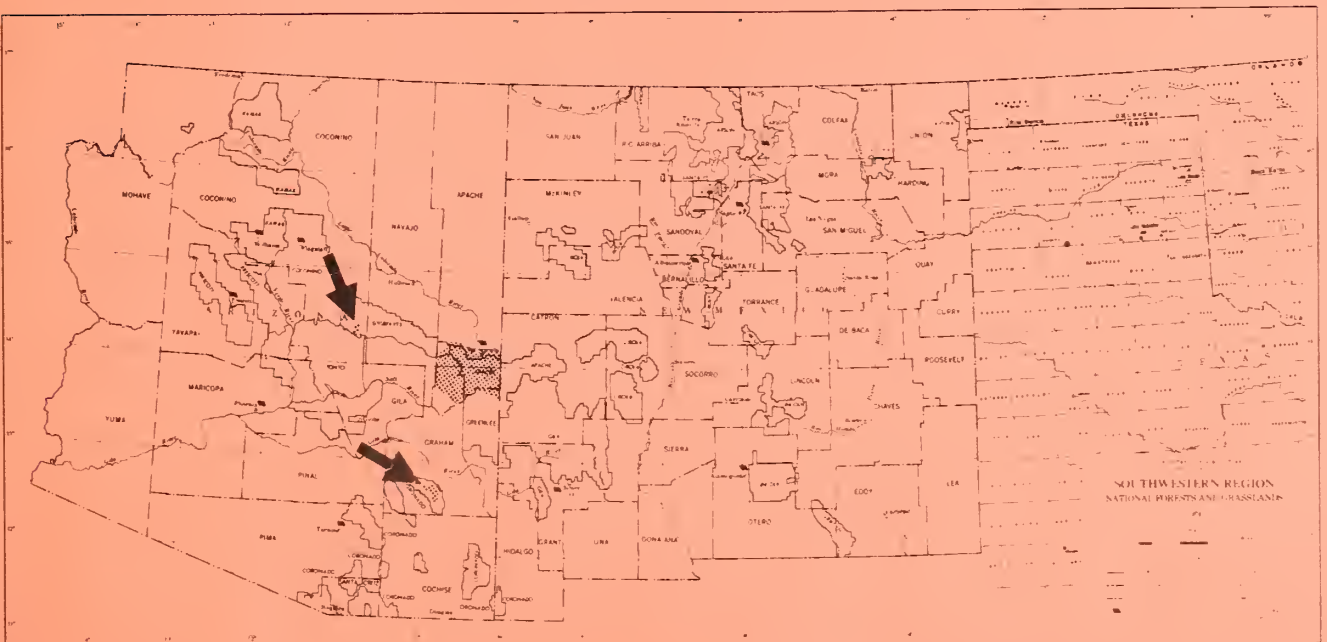
6. Continue I&E work and keep the public informed of the status of this species.

ARIZONA TROUT; APACHE TROUT

Salmo apache (Miller)STATUS: Endangered

REGIONAL DISTRIBUTION: Apache-Sitgreaves, Coronado, and Kaibab National Forests. Present population in National Forests is due to stocking carried out in cooperation with the Arizona Game and Fish Department.

HABITAT TYPE ASSOCIATION: This species is native to the alpine headwaters of the White River drainage in east-central Arizona at elevations of 9,000 feet and above. Stream bank vegetation ranges from alder-willow-oak to aspen and mixed conifer.



DISTINGUISHING CHARACTERISTICS: The Arizona trout is quite similar to the Gila trout, and difficult to separate from the latter species on external characteristics alone. The Arizona trout has a slightly longer dorsal fin, and smaller, hence more numerous scales. The most obvious difference is larger and less numerous spots on the Arizona trout, particularly on the dorsal and caudal fins. Fresh specimens have variable colors, usually a dull, brassy, yellow-olive base, and in certain light some specimens may show pink or purple tints. Sides and belly are rich yellow varying from nearly olive to golden. All have a yellowish cutthroat mark under the lower jaw. Black pigmentation shows in the iris of the eye of living specimens, giving a mask-like effect. All fins show a good deal of color with much variability. They are primarily red-orange but shade off into white margins. The front edge of the pelvic and anal fins is milky white. The rear edge of the pelvic fin has a narrow black edge which is more noticable in fish more than 3 1/2 inches long. Positive identification of a pure strain is a matter for the experts.

LIFE HISTORY DATA: Practically no data is yet available for this species.

REPRODUCTION: Spawning habits are assumed to be similar to those of the rainbow trout, or at least overlapping, since the two species hybridize readily. Spawning is thought to take place in March or April.

NUMBER OF YOUNG: Eggs are produced at the rate of 200 to 600 per adult female. Incubation takes 5 to 6 weeks. Hatchery fish spawn in March at a temperature of near 52° F.

FOOD HABITS: Unknown. Thought to be similar to those of the cutthroat trout, but feed at surface on terrestrial insects more than other trouts. 1/

HAZARDS TO THE SPECIES: The primary hazard to this species is the readiness with which it hybridizes with introduced species of trout. This coupled with human activities such as modification of habitat by removing timber, excessive grazing and other manipulations of ground cover are thought to be responsible for the decline of the species.

HABITAT REQUIREMENTS: The wild stock of this species inhabits the clear, cold, alpine headwaters of the White River drainage in Arizona's White Mountains. Hatchery stock has been planted in similar streams on the Apache-Sitgreaves, Coronado, and Kaibab National Forests. These streams are at an average elevation of about 9,000 feet. Stream bank cover types are described under vegetative type association above. These perennial streams flow, with a volume of not less than 1.0 c.f.s. (cubic feet per second) during low flow. These trout seem to favor short, deep pools below strong riffles, undercut bank ledges, or areas near brush piles at the edge of the stream.

1/ Personal communication from Dr. W. L. Minckley.

PROTECTIVE MEASURES ALREADY TAKEN:

1. The Arizona Game and Fish Department has a good hatchery stock of Arizona trout at Sterling Spring Hatchery. Offspring from this brood stock have been used to introduce these trout into Ash, Deadman, Gibson, Grant, Marijilda, Moonshine, Post, and Soldier Creeks in the Pinaleno Mountains on the Coronado National Forest; North Canyon on the North Kaibab; Grant and K. D. Creeks, and Bear Canyon Lake on the Apache-Sitgreaves National Forest. Those creeks listed are closed to fishing.

2. Cooperative interagency surveys on the life history of the species are being conducted jointly by the Arizona Department of Game and Fish and the Forest Service.

3. Aggressive protection and restoration programs are being carried on by the White Mountain Apache Tribe. The species was first identified on these reservation lands.

MANAGEMENT PROPOSALS:

1. Continue to cooperate with the Arizona Game and Fish Department to determine life history requirements and restoration needs.

2. Conduct cooperative interagency stream analysis to determine habitat conditions.

3. Maintain stream water quality to prevent degradation of habitat.

4. Give this species management consideration in all Forest functional activities which may encroach upon or disturb its habitat. Make efforts to preserve and protect all existing habitat occupied by this species.

5. Continue to cooperate with the Arizona Game and Fish Department in making supplemental fish plantings in the known streams with existing populations of the species for restoration purposes, and continue to manage these streams for this species only.

6. Consider the installation of stream fish barriers, if needed, on rehabilitated streams to prevent upstream movement of undesirable fish species.

NOTES

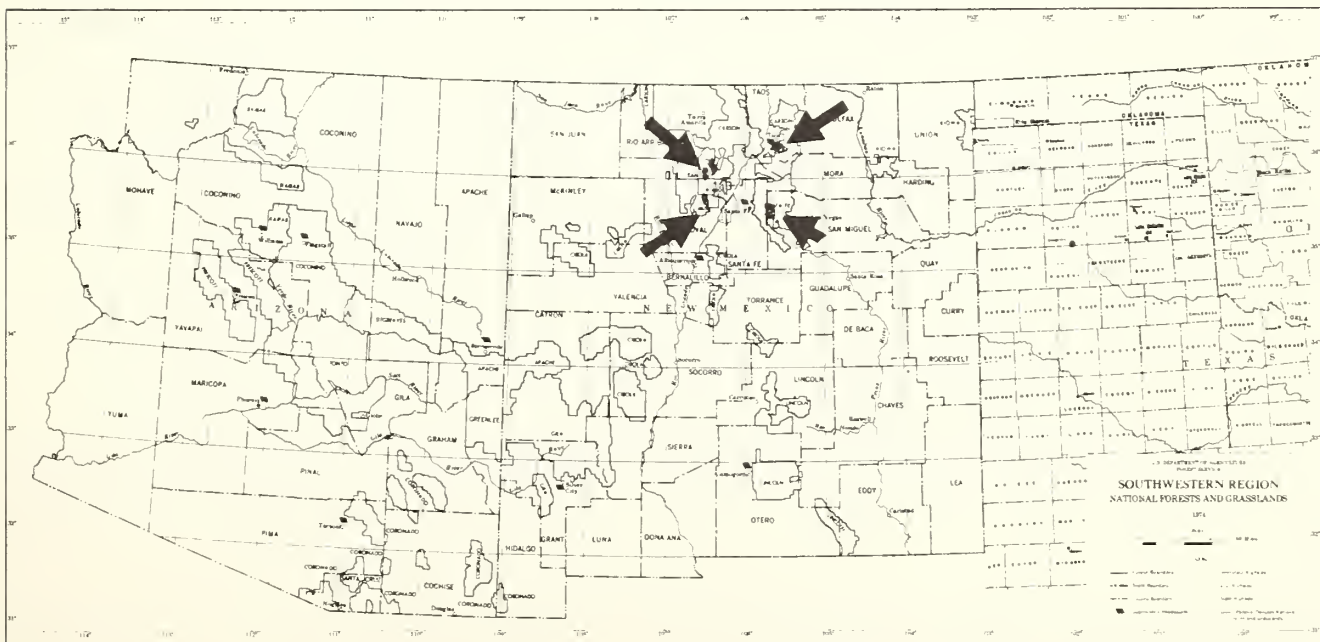
RIO GRANDE CUTTHROAT TROUT

Salmo clarki virginalis (Girard)

STATUS: Unique; pure strains have been identified from only a few streams at the headwaters of the Rio Grande drainage.

REGIONAL DISTRIBUTION: Carson and Santa Fe National Forests. Pure strains are known only from the Rio Chiquito, Rito de la Olla and Frijoles Creek on the Carson National Forest and Canones and Peralta Creeks on the Santa Fe National Forest. Possibly relicts of this cutthroat may exist in other headwater streams of the Rio Grande system, on both the Carson and Santa Fe National Forests.

HABITAT TYPE ASSOCIATION: The Rio Grande cutthroat inhabits headwater tributaries; streams with clear, cold, flowing water. Riparian vegetation ranges from alder-willow to aspen-mixed conifer. These perennial streams have a base flow of not less than 2 cubic feet per second (c.f.s.).



DISTINGUISHING CHARACTERISTICS: It is extremely difficult, if not impossible, to distinguish the Rio Grande cutthroat from other cutthroat trout species by means of external characteristics alone. Coloration tends toward the more pastel hues; a light rose to red-orange on the sides shading off to pink or yellow-orange on the belly. Sexually mature individuals, especially males, tend to show more pronounced color. Environment and diet may also affect color intensity. The lower fins are usually tinted red or orange, and a prominent cutthroat mark, usually red or sometimes orange may be seen. The range of lateral scale counts is 145-175, with 35-40 above the lateral line.

LIFE HISTORY DATA: Life history of this species is only partially known.

REPRODUCTION: Fecundity of this trout is unknown, but is thought probably to be similar to other cutthroats. If so, it spawns in spring or early summer, depending upon water temperature, in flowing water, in clean gravel.

FOOD HABITS: Feeding can be assumed to be typical of cutthroat trout in general. That is, it is opportunistic in character, and food consists mostly of invertebrate species which drift in the stream. Midge larvae, caddis flies, and mayflies are frequently taken, according to one research study.

HAZARDS TO THE SPECIES: Human activities resulting in modification of the habitat, such as timber harvest, overgrazing, pollution and diversion of water for irrigation have all had an influence on the decline of the species. Perhaps an even greater threat is hybridization and competition with introduced species of trout. Intensive angling may favor introduced trout, because of greater vulnerability of the cutthroat.

HABITAT REQUIREMENTS: See the description under habitat type association above. The habitat preferred by this species is typical of interior cutthroat trout in general. They are apparently best adapted to clear, cold waters of small streams, but able to do well in lakes, (if not in competition with other trout). This species needs flowing water and clean gravel beds for spawning.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Cooperative interagency studies by the New Mexico Department of Game and Fish, Colorado State University and the Forest Service to determine locality of pure strain Rio Grande cutthroat populations.
2. Closure of certain stream sections to public fishing which contain pure strain populations.
3. Reduced creel limit in certain Rio Grande cutthroat waters.
4. Fish barrier installed on the Rio Chiquito, Rito de la Olla and Frijoles Creek (all on the Carson National Forest) to prevent upstream movement of introduced trout species.

5. Electroshocking and removal of competing German brown trout.
6. Closure and reseedling of old logging roads on the Rio Grande Grant (Carson NF) to reduce degradation of stream habitat through erosion and sedimentation.
7. Periodic habitat improvement through the removal of old logging slash from Rio Grande cutthroat waters following spring runoff.
8. A habitat management plan is in effect on the Santa Fe National Forest.
9. Tentative identification, based on morphological appearance (mainly the spotting patterns), of pure strain Rio Grande cutthroat populations in ten additional waters on the Santa Fe National Forest.

MANAGEMENT PROPOSALS:

1. Continue to implement the management direction contained in the approved habitat management plan on the Santa Fe National Forest.
2. Prepare and implement a comparable habitat management plan for application on the Carson National Forest.
3. Continue cooperative field surveys with the New Mexico Department of Game and Fish to determine life history requirements including distribution, habitat needs, and population levels.
4. Continue to give the species management consideration in all Forest functional activities to prevent encroachment on and disturbance of habitat. Make efforts to protect and preserve existing areas where the species is presently found.
5. Continue to maintain stream water quality standards.
6. Provide additional funds needed as they become available for cooperative study by the New Mexico Department of Game and Fish, Colorado State University, and the Forest Service to evaluate and define population levels, distribution, and restoration potential for the species.

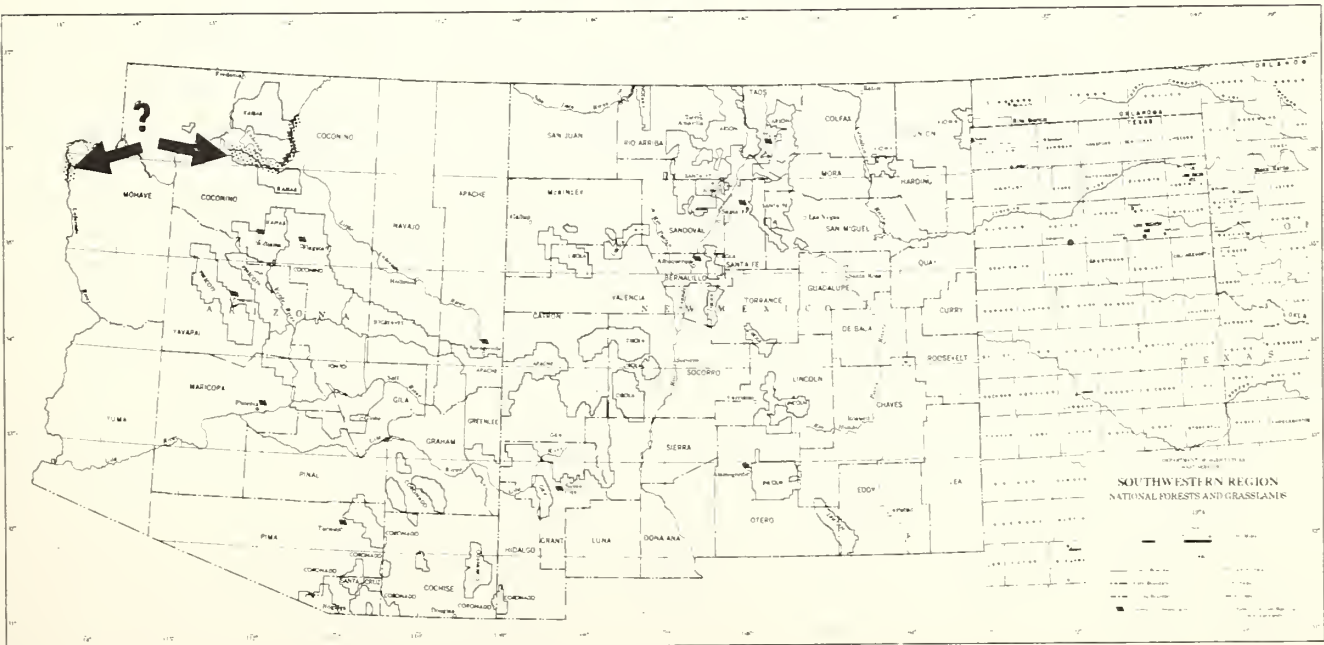
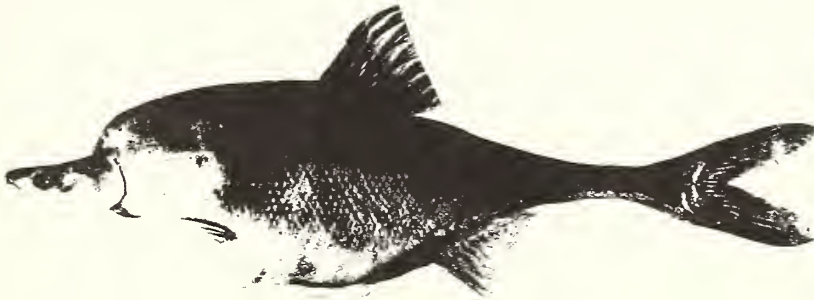
NOTES

HUMPBACK CHUB

Gila cypha (Miller)STATUS: Endangered

REGIONAL DISTRIBUTION: The species is thought to have been limited to the Targer tributary canyon areas of the Colorado basin between Grand Canyon and Green River, Wyoming. It is now probably present in the Region only above the Grand Canyon, if at all. It is most likely to be found between Grand Canyon and Glen Canyon Dam. It is included here because portions of the Salt River Canyon, Tonto National Forest are considered to be an excellent transplant site.

HABITAT TYPE ASSOCIATION: This is a big river species, adapted to live in strong turbulent currents of large rivers.



DISTINGUISHING CHARACTERISTICS: The species has a tendency to hybridize by crossing with the Bonytail, Gila elegans, which makes identification of pure humpback chub more difficult. The distinctive characteristics are a stream-lined body, small scales, large sickle-shaped fins, a definite, abrupt dorsal hump and a fleshy snout projecting beyond the jaw. This is a large minnow which may grow to a length of more than one foot and weigh in excess of one pound.

REPRODUCTION: Due to the lack of valid specimens of pure Gila cypha little is known of the life history of this species, and very little farther research can be undertaken.

FOOD HABITS: Not known. Probably carnivorous, feeding on various forms of aquatic invertebrates, and possibly small fish of other species.

HAZARDS TO THE SPECIES: Human activities, especially dam building, resulting in modification of the habitat have probably had the greatest influence on the decrease in population of the species. These environmental changes have probably stimulated hybridization of the species with Gila elegans (Bonytail) which has hastened the decline of humpback chub.

HABITAT REQUIREMENTS: Ichthyologists have deduced from the forms and development of the fish, and the characteristics of the collection sites that the species inhabited the channels of large rivers where the flow became strong and turbulent due to constriction of canyon walls.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Protective measures to date have consisted primarily of research efforts by professional and academic ichthyologists.
2. Protected by State law in Arizona.
3. Protected by the Endangered Species Act of 1973.

MANAGEMENT PROPOSALS:

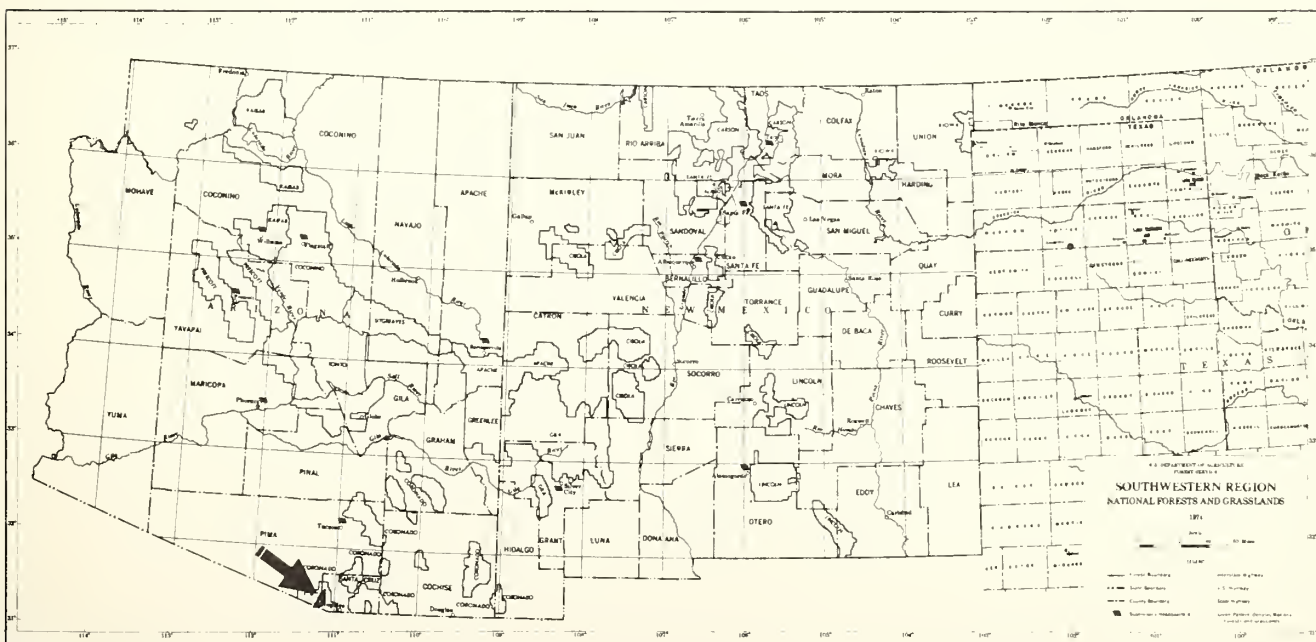
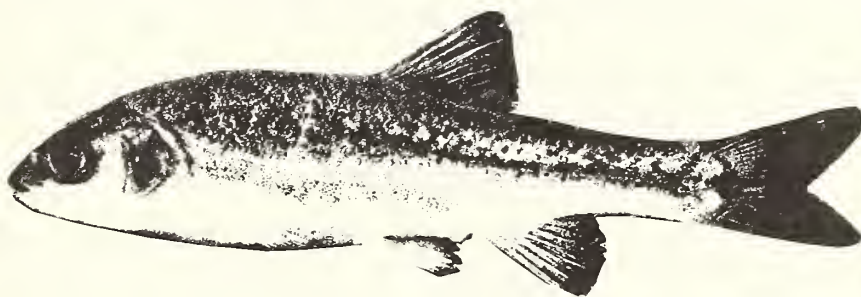
1. Be alert for the possible presence of the species in strong flowing, large streams. Report any populations discovered so researchers may advance their study.
2. Be prepared to participate or assist in research efforts if the opportunity is afforded.

SONORA CHUB

Gila ditaenia (Miller)STATUS: Unique; a peripheral species from MexicoREGIONAL DISTRIBUTION: Coronado National Forest.

Known only in Sycamore Canyon in the Pajarito Mountains on the Gooding Research National Area; Coronado National Forest. The known range extends into Northern Mexico where it is restricted to certain drainages. Population levels were excellent in March 1974 (personal communication Dr. Minckley).

HABITAT TYPE ASSOCIATION: It is the only species of native fish present in Sycamore Canyon a small, permanent spring-fed stream. Riparian vegetation includes sycamores, cottonwoods, alder, willow, oak, and pine.



DISTINGUISHING CHARACTERISTICS: This minnow is a relatively small fish rarely exceeding six or seven inches in length, although larger than most minnows. The chubs are relatively thick bodied and dark colored. The Sonora chub is covered with fine scales, olivaceous colored, but with a whitish belly. The name comes from two variably colored lateral bands. The round spot at base of tail is an excellent distinguishing characteristic.

REPRODUCTION: Little is known about this species reproduction.

PROTECTIVE MEASURES ALREADY TAKEN:

1. The Forest has established Sycamore Canyon as a Research Natural Area to protect and preserve existing fish and wildlife species and their habitat occurring there.

2. The area has been fenced off to prevent overgrazing.

MANAGEMENT PROPOSALS:

1. Cooperate with Arizona game and fish department and ichthyologists, to gather life history information for management purposes.

2. Continue to manage the Goding Research Natural Area to protect and preserve existing fish and wildlife and thier habitat.

3. Maintain stream water quality standards.

4. Conduct cooperative field surveys to determine if Temporal Canyon and other areas have populations of this species. Consider restoration needs and reestablishment of this species in those streams, if sutiable habitat exists.

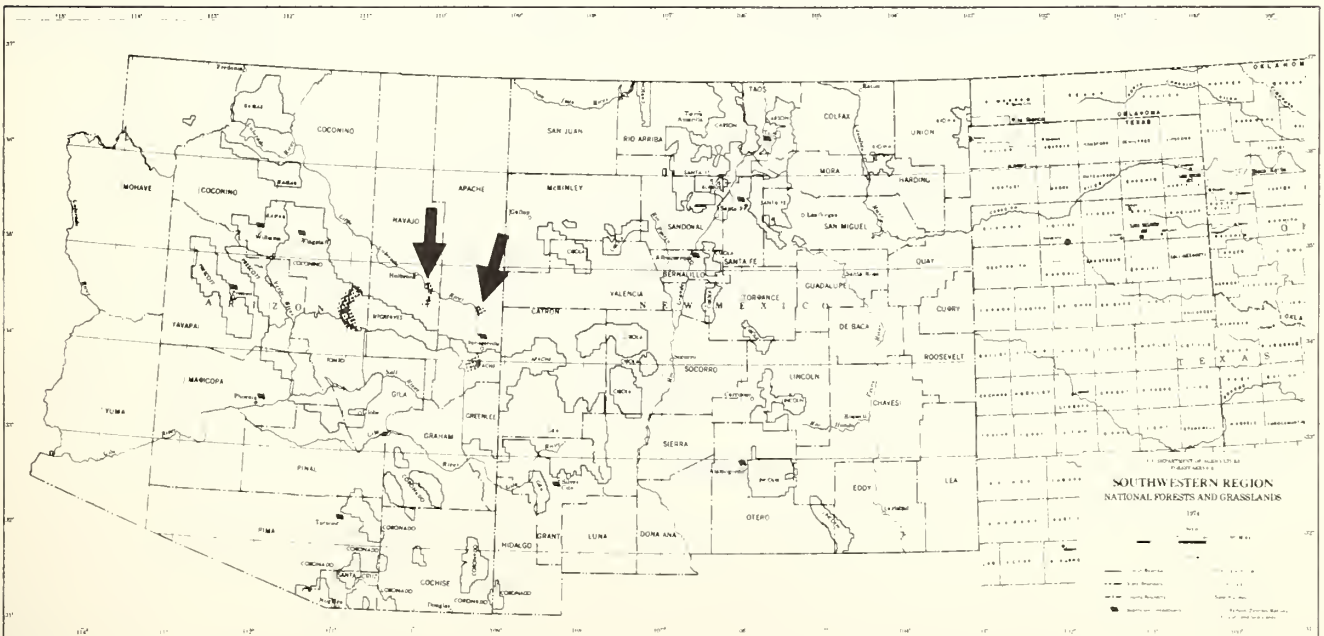
NOTES

LITTLE COLORADO RIVER SPINEDACE

Lepidomeda vittata (Cope)STATUS: Unique

REGIONAL DISTRIBUTION: Coconino and Apache-Sitgreaves National Forests. A remnant population is found in East Clear Creek on the Coconino National Forest and in Silver, Bear Springs and Willow Creeks, all tributary to the Little Colorado River on the Apache-Sitgreaves. These populations are subject to wide annual fluctuations.

HABITAT TYPE ASSOCIATION: Preferred pools have large boulders that provide refuge, and in shallower water the species seeks undercut banks or banks well overhung by riparian vegetation. Riparian vegetation includes alder, willow, oak and mixed conifer.



DISTINGUISHING CHARACTERISTICS: The species is found only in the Little Colorado River basin. It is a silvery minnow very trout like in behavior. The dorsal and anal fins have eight principal rays, the second ray of the dorsal fins is spine like, longer and much stronger than the first. The pelvic fin has seven rays. There usually are more than 90 scales in the lateral line. In life this fish has a silvery color on the sides, but scales reflect light blue to brassy hues; the basal portion of the paired fins and the tip of the anal fin are orange to red-orange in color in breeding males. Total length is near four inches.

REPRODUCTION: Reproduction studies of this species indicate that it is a rather prolific egg producer, yielding 650 to 5600 eggs per female. It is thought that the species is very likely an intermittent spawner or may spawn more than once between May and July. This may be a survival adaptation to the highly variable conditions of its natural environment. Populations fluctuate considerably from year to year in accordance with these changing conditions of habitat, especially condition and volume of water.

FOOD HABITS: Caddis flies constitute a large portion of the diet, but terrestrial insects are also commonly taken. Thus feeding is considered opportunistic although somewhat selective.

HAZARDS TO THE SPECIES: The greatest threat is thought to come from introduced minnows, especially the Golden Shiner, Notemigonus crysoleucus. The species is not generally found with any introduced cyprinid fishes (minnows).

HABITAT REQUIREMENTS: The species seems to adapt well to widely varied environment, at conditions from marginal pools to permanently flowing sections of live streams at 6,000 to 6,600 feet elevation. Observed water temperatures are around 58° - 78° F. and air temperatures from 62.5° F. in the morning to 83° F. in the late afternoon. The habitat in East Clear Creek is characterized by clear, flowing relatively open pools, 1 to 3 feet deep, with water temperatures cold enough for brown and rainbow trout. The species avoids, well shaded deep pools and shallow open areas. It prefers large pools, with flowing water over fine gravels. Dense sedges may occupy most of the available water at higher elevations.

PROTECTIVE MEASURES ALREADY TAKEN:

1. A special management unit has been established for the species on a portion of Willow Creek on the Apache-Sigreaves National Forest.
2. Forests give the species management consideration in all functional activities which may have possible effects on the habitat.
3. Life history studies by Arizona State University, Arizona Department of Game and Fish and University of Michigan.
4. Elimination of live bait seining operations in spinedace waters.
5. Protected by State law in Arizona.

MANAGEMENT PROPOSALS:

1. Continue cooperative interagency life history studies on this species to determine population levels, distribution, habitat and restoration needs.
 2. Continue to give the species management consideration in all Forest functional activities which may encroach upon and degrade its habitat, such as road construction, timber harvest operations, stream gravel removal, and chemical treatment of streams.
 3. Continue to maintain stream water quality standards.
 4. Consider establishing East Clear Creek, on the Coconino National Forest as a special management unit.
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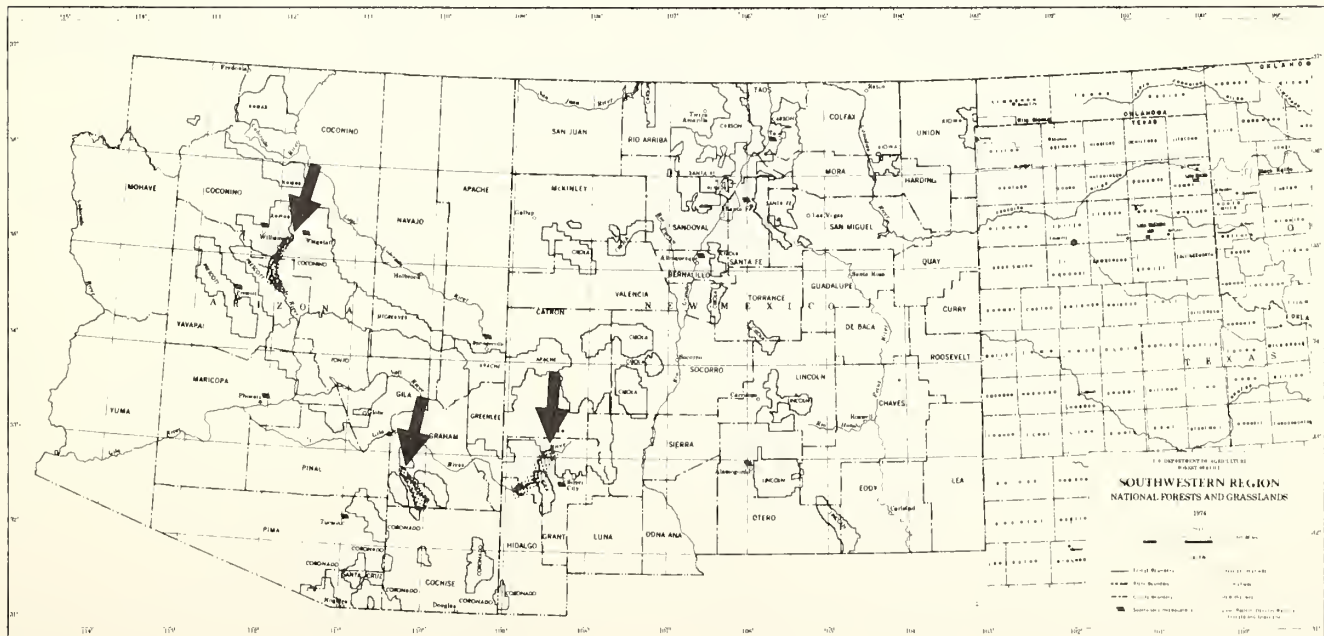
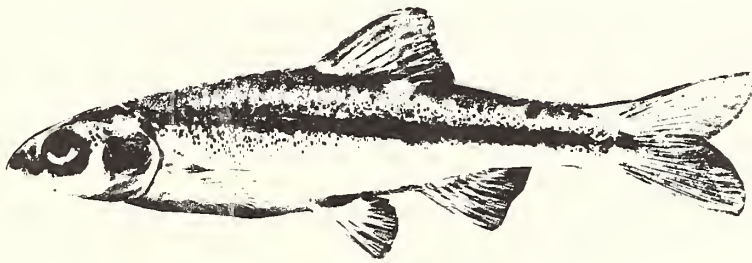
NOTES

SPIKEDACE

Meda fulgida (Girard)

STATUS: Unique, (Group II, New Mexico)

REGIONAL DISTRIBUTION: Apache-Sitgreaves, Coconino, and Gila National Forests. Found in the Gila River drainage of Arizona and New Mexico. A population has been discovered in the upper Verde River and Sycamore Canyon on the Coconino National Forest. It is also known to exist in portions of streams within the Gila National Forest.



DISTINGUISHING CHARACTERISTICS: Somewhat trout-like in behavior in clear waters. Appears to have a molted brownish dorsal surface with white dots at the base of the dorsal fin. This minnow is 2.5 to 3 inches long with a slender, elongated body and head and rounded snout. The mouth is large, subterminal and slightly oblique, lower jaw included. Coloration is basically silvery on the sides and below, with sides sharply marked with tiny, black vertically oriented streaks. Breeding males become bright brassy-gold, while females remain drab.

REPRODUCTION: Additional study is needed to determine details of the biology of this species. Generally, the spinedace lives in slow flowing, long, shallow pools with little or no shade and riffle areas less than 3 feet deep. They usually concentrate where the faster water enters the upper end of the pools. Spawning is in early spring (February or March and April) and takes place in shallow moving water over sandy or gravelly bottoms.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Cooperative interagency field surveys by New Mexico State University, Arizona State University, New Mexico Department of Game and Fish and the Forest Service to determine population levels and distribution.
2. Artificial reproduction of this species at Arizona State University.
3. An attempt has been made to establish this species in upper Cave Creek on the Tonto National Forest.

MANAGEMENT PROPOSALS:

1. Continue to cooperate in live history studies with New Mexico State University, Arizona State University and the New Mexico Department of Game and Fish.
2. Give this species management consideration in all Forest functional activities which may encroach upon or degrade existing habitat.
3. Maintain stream water quality standards.
4. Avoid introduction of Red slriners, Notropis lutrensis which appears to compete directly with and subsequently destroy the population.

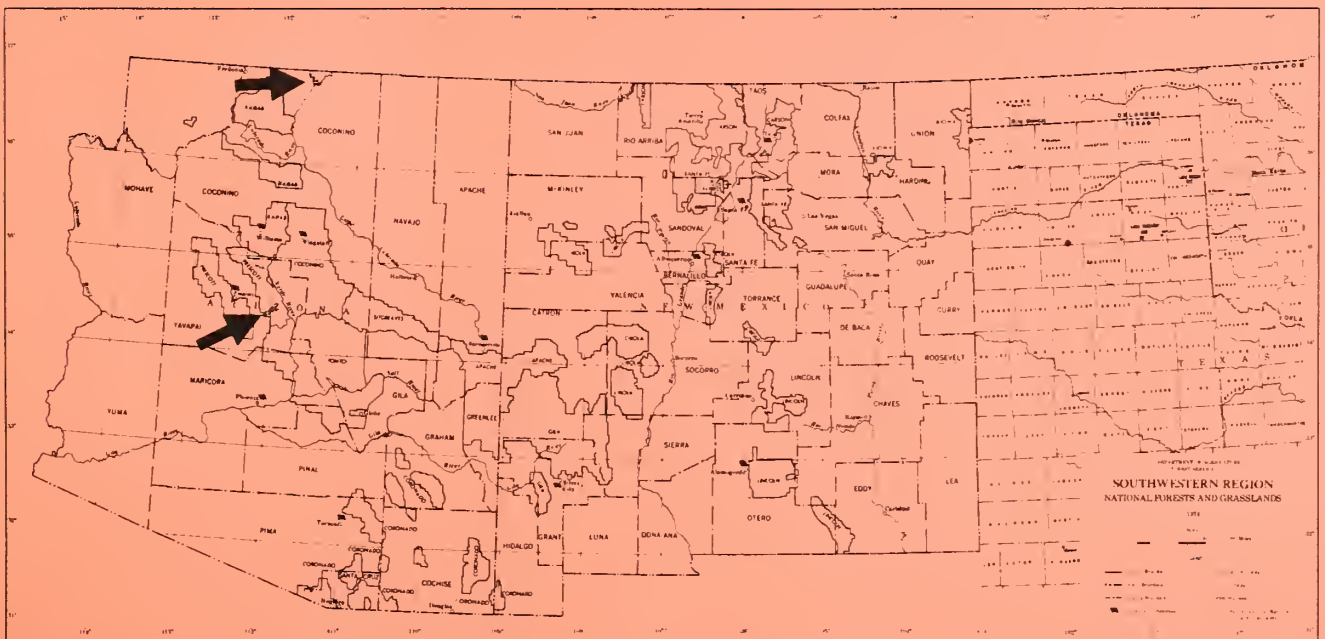
NOTES

WOUNDFIN

Plagopterus argentissimus (Cope)STATUS: Endangered

REGIONAL DISTRIBUTION: Prescott National Forest. This species is no longer known to occur naturally in any of the National Forests in this Region. However, two plantings were made in Sycamore Creek in the Pine Mountain area of the Prescott National Forest early in 1973. Other transplants have been made at 3 other locations in Arizona, on National Forests.

HABITAT TYPE ASSOCIATION: A "big river" fish which is now known to occupy only the swift, turbid waters of the Virgin River drainage in Washington County, Utah, Arizona and Nevada. It formerly inhabited the Gila River system in Arizona, but was eliminated presumably because of alterations of its habitat.



DISTINGUISHING CHARACTERISTICS: A small slender, scaleless minnow, about 2 1/2 inches in length, color clear silvery (occasionally with golden tint). Dorsal fin entirely behind ventrals, first spine curved and longer than second ray of the ventral fin is attached to the abdomen for nearly its whole length by a membrane. Lateral line complete, somewhat deflexed. Head and belly flattened, and mouth small and nearly horizontal.

REPRODUCTION: Very little is known at this time of the biology of this species. Currently under intensive study by University of Nevada, Las Vegas, Nevada.

HAZARDS TO THE SPECIES: It is believed this species was extirpated from the Gila River system because of habitat deterioration.

HABITAT REQUIREMENTS: This species is well adapted and seems to thrive in swift shallows over moving sand bottom in the Virgin River, downstream from the inflow of mineralized La Verkin Spring. Small populations of woundfin exist in less heavily mineralized waters. This species is able to tolerate exceedingly high turbidity.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Woundfin were introduced by two planting in Sycamore Creek (Pine Mountains) on the Prescott National Forest.
2. A recovery team has been established.
3. Excellent research is underway.

MANAGEMENT PROPOSALS:

1. Cooperate with the woundfin recovery team in life history studies.
2. Continue to cooperate with the Arizona Game and Fish Department, in the woundfin transplanting program, including surveys to determine the suitability of additional transplant sites.
3. Give management consideration to further possibilities of transplanting wound fin in other functional activities which may encroach upon or degrade existing habitat.

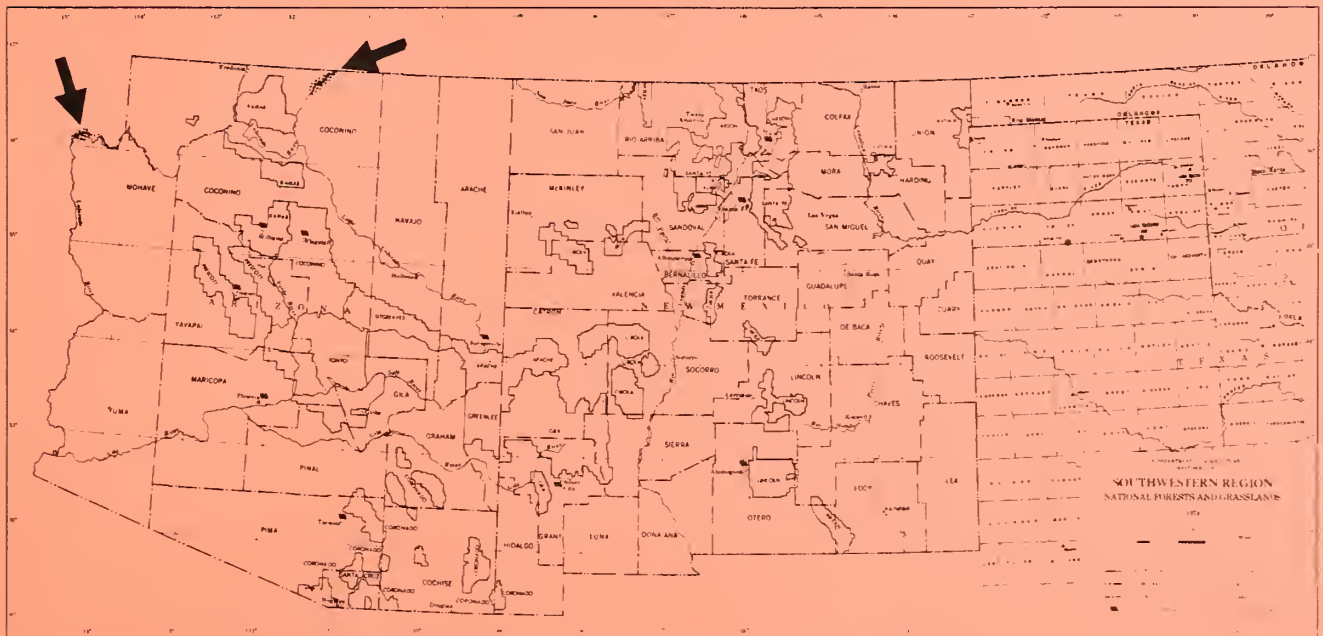
COLORADO RIVER SQUAWFISH;
COLORADO RIVER SALMON

Ptychocheilus lucius (Girard)

STATUS: Endangered; almost unknown in the lower Colorado basin below Glen Canyon Dam, (Group I, New Mexico)

REGIONAL DISTRIBUTION: Thought to be extirpated from all National Forests in the Region. Of interest because of proposals to reintroduce into the Salt and Gila Rivers if artificial propagation proves successful.

HABITAT TYPE ASSOCIATION: This fish is normally associated with the large channels of mainstems of rivers and major tributaries, and low desert type riparian vegetation.



DISTINGUISHING CHARACTERISTICS: This is the largest native minnow of North America and can reach lengths of nearly five feet, and weigh up to 80 pounds. It has long slender body and a deeply forked tail. The head and jaws are long with the jaw extending to the rear margin of the eye. A good distinguishing mark for young specimens is a dark, wedge-shaped spot at the base of the tail.

REPRODUCTION : No detailed data is available on this aspect of the life history of the species. One requirement seems to be relatively warm water (68° - 72°F.) to stimulate spawning. There appears to be a downward trend in success of natural reproduction. Much more study is needed to determine factors influencing reproduction.

FOOD HABITS: Here again very little data is available. Young squawfish, less than 4 inches in length feed predominantly on invertebrates. As size increases the inclusion of other fish in the diet increases. After Colorado River Squawfish achieve a length of about 8 inches, fish become the main part of the diet. The dominant food item within the Upper Colorado Basin at this stage seems to be an introduced species the red-side shiner, Richardsonius balteatus hydrophlox.

HAZARDS TO THE SPECIES: Competition and predation from introduced species and the secondary effect resulting from exposure to new parasites and diseases never before experienced by the species have taken their toll. Change of environment caused by dam construction on the home rivers of the squawfish and their major tributaries have caused negative alterations in the environment for the species.

HABITAT REQUIREMENTS: This is a "big river" fish, in the main channels or large rivers and their major tributaries. Recent collection for studies were made, not from fast water, but from quieter areas on pools and eddies. The bottom types were variable. Little or nothing is known of spawning and nursery type habitat needed.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Limited preliminary studies on life history.
2. Six adult specimens are being held at Willow Beach National Fish Hatchery for study and propagation, and more brood stock is to be obtained. Artificial propagation has resulted in producing several hundred specimens.

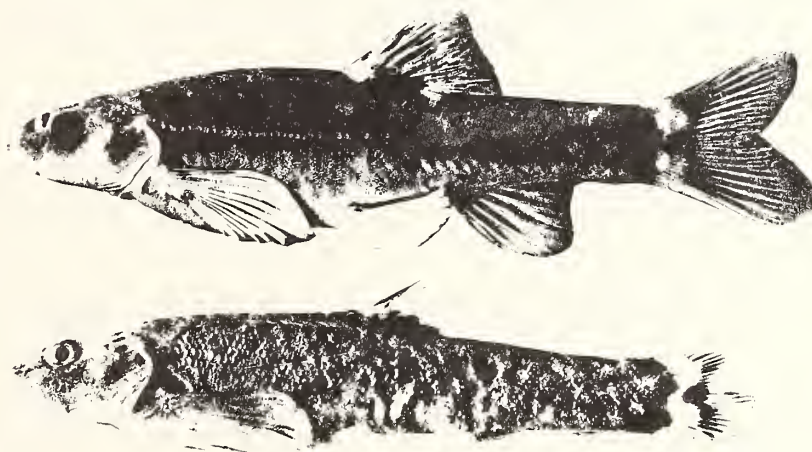
MANAGEMENT PROPOSALS:

1. Cooperate with the Lower Colorado River Basin Recovery Team, and state game and fish departments in reintroduction of the Colorado River Squawfish into the suitable portion of the Salt or Verde Rivers.
2. Continue cooperative studies with Arizona State University to determine presence and numbers of squawfish in the Salt River.

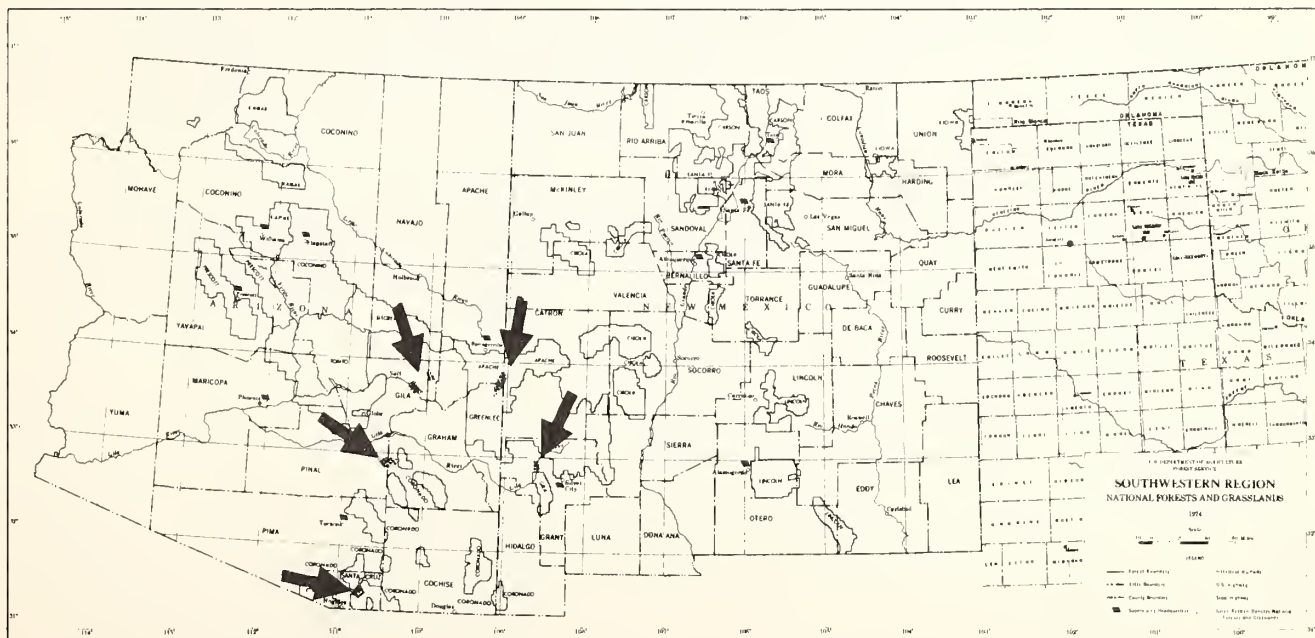
LOACH MINNOW

Tiaroga cobitis (Girard)STATUS: Unique, (Group II, New Mexico)

REGIONAL DISTRIBUTION: Apache-Sitgreaves National Forest. Known to occur naturally only in the Blue River drainage on the Apache-Sitgreaves National Forest, in the Gila River between Gila and Cliff in New Mexico, and in Aravaipa Creek. This species probably still exists in small numbers in the Salt River or its tributaries, Fort Apache Indian Reservation and Tonto National Forest.



Male above, female below



HABITAT TYPE ASSOCIATION: The Loach minnow occurs in flowing sections of the Gila River with shallow, unshaded pools and riffles less than 3 feet deep. An open, low growing riparian type composed mostly of grass and shrubs seems to be most typical of the area where this species is found.

DISTINGUISHING CHARACTERISTICS: This is a small minnow (2 1/2 inches) with a long slender body, olivaceous in color with dusky specks above, and with many very small scales. The species has a small, nearly vertical mouth, a black spot at the base of the tail with a pair of yellowish spots, one above and below the black spot. This is a swift water fish, most frequently found in shallow trubulent water over gravel-small boulder bottoms, and the presence of filamentous algae.

REPRODUCTION: Spawning occurs in late winter or early spring with the bulk of 250 to 1200 young, appearing February through March. Females spawn in second year few live to spawn in their fourth year.

FOOD HABITS: The species appears to have restricted food habits. The Loach minnow feed on black fly larvae as long as they are available, then changes to one kind of mayfly, then back to the black fly. This may be a clue to the creek on which the observations were made, or a unique characteristic of the species.

HAZARDS TO THE SPECIES: Habitat alteration- population may be decimated by introduced predators.

HABITAT REQUIREMENTS: This fish inhabits riffles, usually in areas of turbulence and where thire is a rich growth of filamentous algae attached to the rocks. However, in Aravaipa Creek Tiaroga was found in areas characterized by coarse gravel or small rubble bottoms in water less than 8 inches deep with a flow of about 2 c.f.s.

PROTECTIVE MEASURES ALREADY TAKEN:

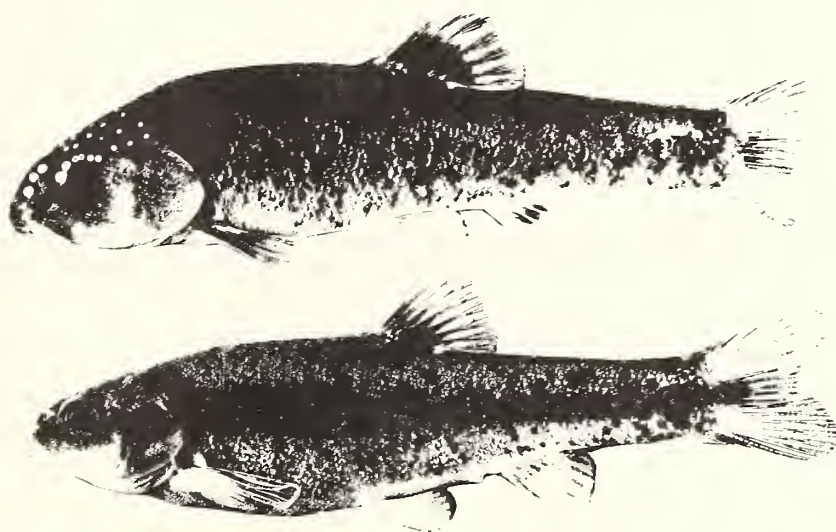
1. Cooperative interagency field surveys by New Mexico State University, Arizona State University, New Mexico Department of Game and Fish and the Forest Service to determine population levels and distribution.
2. Artificial reproduction of this species at Arizona State University.
3. The Arizona Game and Fish Department has attempted to establish this species on Seven Springs Wash on the Tonto National Forest. This effort is thought to have been unsuccessful.

MEXICAN STONEROLLER

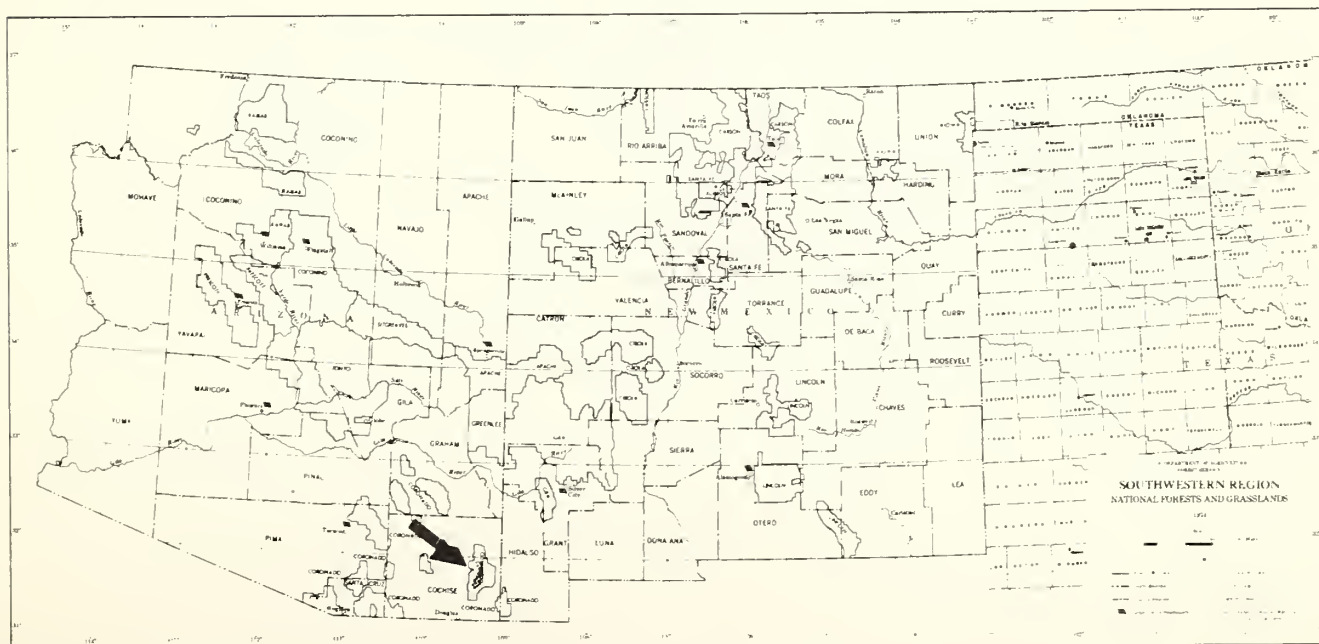
Campostoma ornatum pricei (Jordan & Thoburn)STATUS: Unique

REGIONAL DISTRIBUTION: Coronado National Forest. This is a peripheral species common in the Rio Conchos in Chihuahua, Mexico but known only in Rucker Canyon and Leslie Creek in Arizona.

HABITAT TYPE ASSOCIATION: The Mexican Stoneroller is found in pools of clear, low-flow streams in moist canyons, with riparian vegetation which includes alder-willow and pine-cottonwood types.



Male above, female below



DISTINGUISHING CHARACTERISTICS: Large adults frequent deeper pools near bottom and are "sucker" like in behavior. Juveniles have a distinct black lateral stripe, easily visible in clear water. The male of the species can be recognized in spring by the presence of tubercles on the head and mouth. Stonerollers are distinguished from all other fishes by the unique arrangement of the intestines which encircles the air bladder. Other identifying characteristics are the large number of scales (73) in the lateral line and small size of the mouth in proportion to a rather large head.

REPRODUCTION: Little is known of life history requirements of this species.

FOOD HABITS: This is a moderate sized minnow which is herbivorous.

PROTECTIVE MEASURES ALREADY TAKEN: Protection and preservation of existing riparian vegetation.

MANAGEMENT PROPOSALS:

1. Cooperate with the Arizona game and fish department, and researchers to determine life history information for management purposes.
2. Continue to give this species management considerations in all Forest functional activities to prevent degradation of its habitat.
3. Maintain stream water quality standards.
4. Conduct Region 3 stream analysis on Rucker Canyon and with the Arizona game and fish determine location of existing populations.
5. Write a management plan for the species based on the stream analysis.
6. Avoid introduction of predatory fish species in known Mexican stoneroller waters.

NOTES

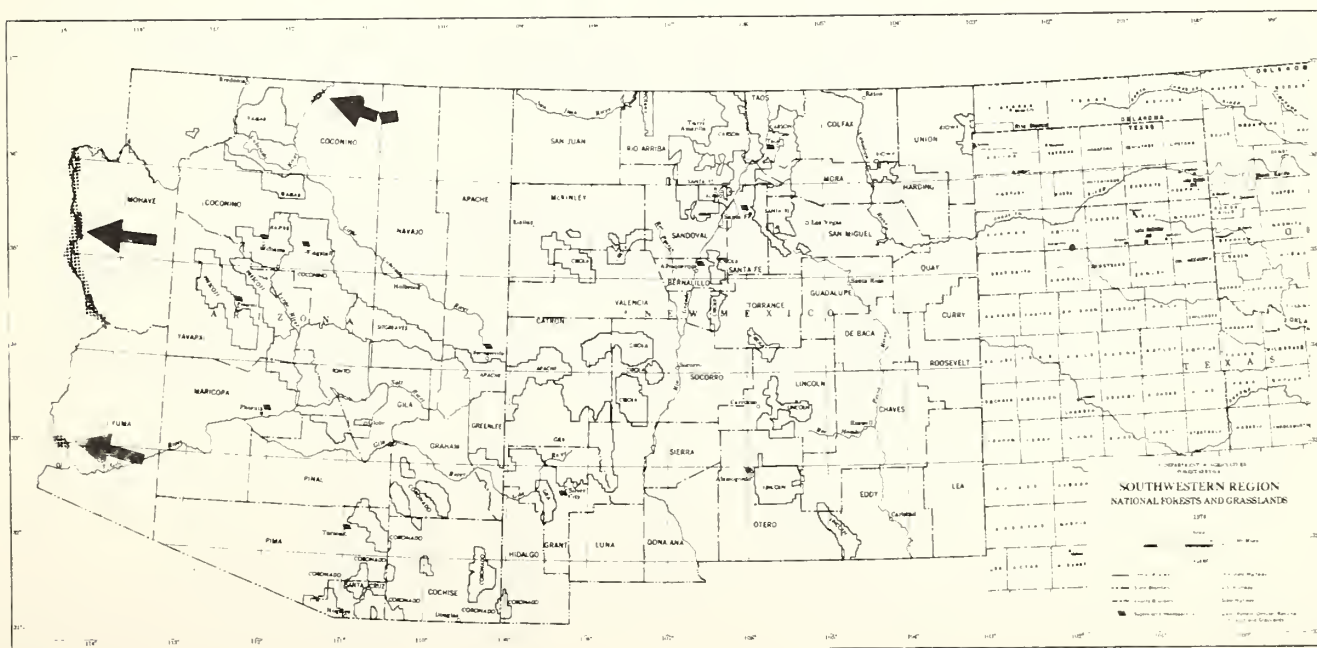
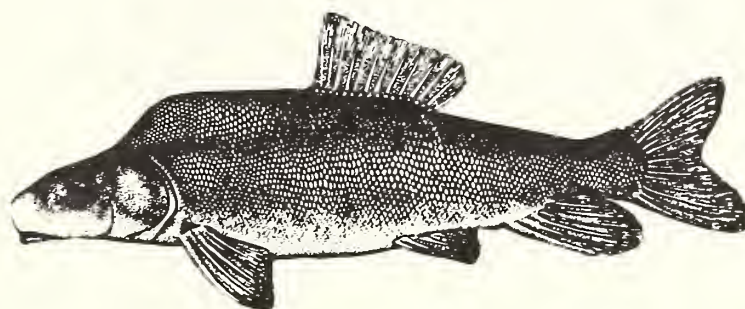
HUMPBACK (RAZORBACK) SUCKER

Xyrauchen texanus

STATUS: Unique; of interest as a one-of-a-kind species with declining population.

REGIONAL DISTRIBUTION: Historically this species was indigenous to the main stream of all large tributaries of the Colorado and Green Rivers, above and below Grand Canyon. Although small populations are known to exist within the reservoirs of the lower Colorado River at the west boundary of Arizona, it is extremely unlikely that any occur within National Forest boundaries.

HABITAT TYPE ASSOCIATION: Although the body form of this fish would lead to the conclusion that it was adapted to the swift current of big rivers, most specimens have been collected from the back waters of big rivers or from impounded waters.



DISTINGUISHING CHARACTERISTICS: The species is a large, sucker type fish, reaching lengths in excess of two feet and weights in the range of 10-16 pounds. The most obvious characteristic is a sharp-edged dorsal hump just behind the head.

REPRODUCTION: Much of the life history data for this species is presently incomplete, or the available information is in conflict.

Reduced reproduction is probably the critical limiting factor resulting in reduced populations of this species. Only very incomplete data is available. Spawning takes place in the spring months, March through June, depending upon geographical location. Typically it occurs in calm waters over silt or gravel over depths of 1 to 20 feet and at a temperature range of 54-68° F. River rather than lake habitat seems to be preferred for spawning.

FOOD HABITS: Only very limited data is available. Food apparently is obtained by sifting of bottom ooze, and consists of both plant and animal matter.

HAZARDS TO THE SPECIES: Like the humpback chub this species' existence is most threatened by the environmental change which results from damming large rivers. This in turn increases the threat of cross breeding and hybridization with other suckers, (Catostomus). The threat is even greater if the introduction of non-native suckers of the above genus is permitted.

HABITAT REQUIREMENTS: As stated above the type of habitat in which this fish has been collected is not consistent with what would be expected from this fish's body form. Quiet backwaters and impoundments of large rivers are the habitat where most commonly the humpback sucker has been recorded.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Specimens are being held in Willow Beach Hatchery for artificial propagation.

2. Research efforts of professional and/or academic ichthyologists are underway.

MANAGEMENT PROPOSALS:

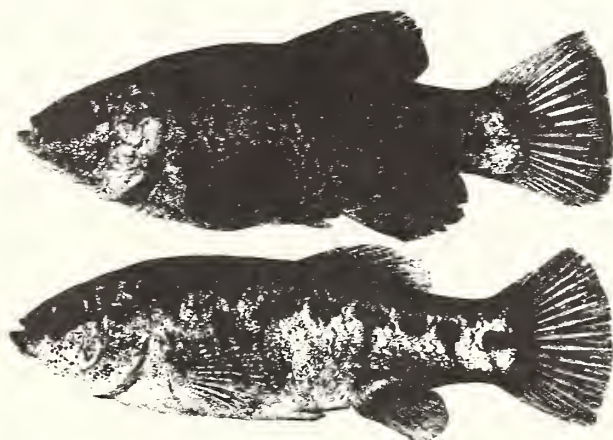
1. Be alert to the possible presence of unknown populations of this species in large river systems. Report any populations or individuals discovered to permit followup by researchers.

2. Be prepared to participate or assist in research or management efforts by university researchers and/or state game and fish departments.

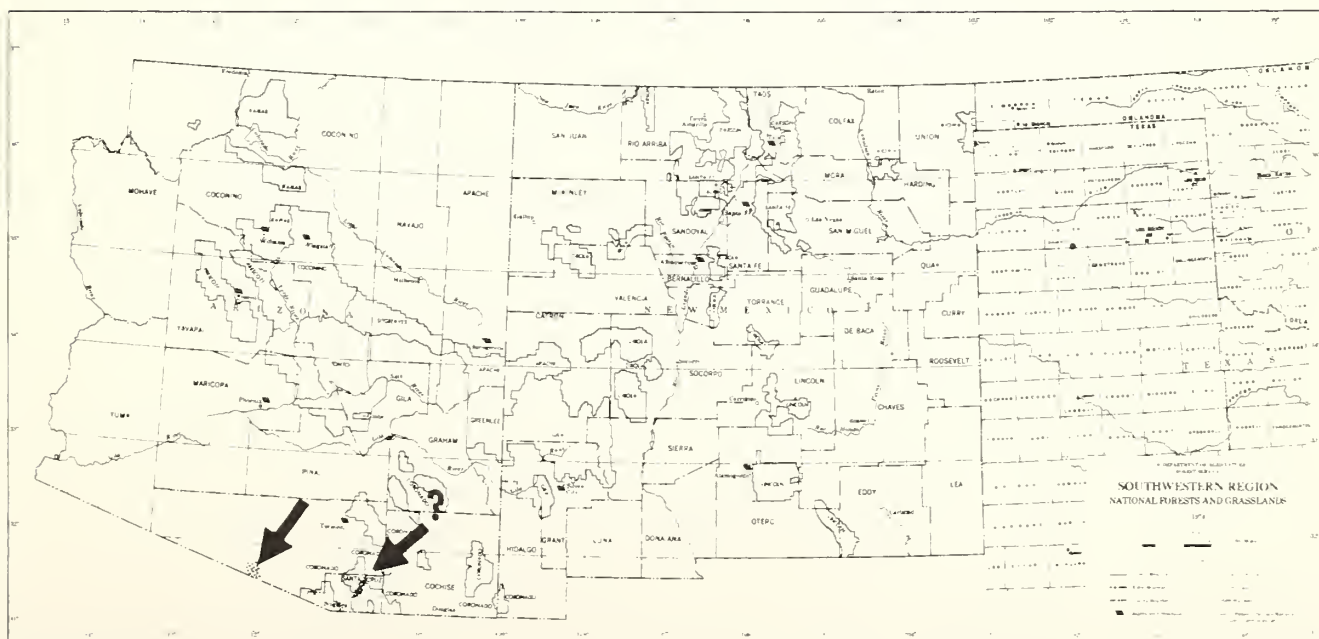
DESERT PUPFISH

Cyprinodon macularius (Baird and Girard)

STATUS: Unique; of interest as a rare species of very limited distribution, formerly common now nearly extirpated.



Male above, female below



REGIONAL DISTRIBUTION: Possibly in some unknown location on the Coronado National Forest. At present this species is known from only one locality in Arizona. This population is on the Oregon Pine National Monument and is not representative of the formerly-wide spread form.

HABITAT TYPE ASSOCIATION: Characteristically these fish are found in springs, marshes, or sluggish streams in the desert portion of the southwest.

DISTINGUISHING CHARACTERISTICS: A small, coarse scaled pupfish with a proportionately large head and rounded tail. Overall length may be up to two or more inches. The color is variable, but males are dark with back and sides uniformly dusky and under parts lighter. Dorsal and anal fins are darkened at least at the margins. The females are drably colored and rather inconspicuous, with the lower half of the sides and belly silverish and black or dark cross bars on the sides.

REPRODUCTION: Breeding has been observed to take place between March and September. During this period the males are highly territorial and pugnacious as well as being violently active. When the females are ready to spawn they move inconspicuously into the male's territory, make specific movements to stimulate the spawning act, and just as quietly move away from the area. Eggs are deposited at random on soft, silty bottoms. The parents do not extend any special care to the young. In warm waters young mature in about six weeks, and the breeding cycle is perpetuated.

FOOD HABITS: Unknown. The type form, formerly found in Sonoita Creek is difficult to maintain in captivity. The species apparently needs natural habitat to survive.

HABITAT REQUIREMENTS: Desert streams and springs are the native habitat of this species. Studies of one native population indicate they are quite flexible in their adjustment to extremes in environment, especially high water temperatures and salinities. Groups of these pupfish move to areas of most favorable conditions in response to changes in temperature and salinity, and remain in these spots for variable periods up to several months. In some places in the Salton Sea, pupfishes have at times lived in temperatures in excess of 100° F. and salinities nearly triple that of sea water.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Considerable study has been made of this species by Arizona State University, under grants by the Sports Fishing Institute and National Science Foundation.
2. Protected by State law in Arizona.

GILA TOPMINNOW

Poeciliopsis occidentalis occidentalis (Baird & Girard)

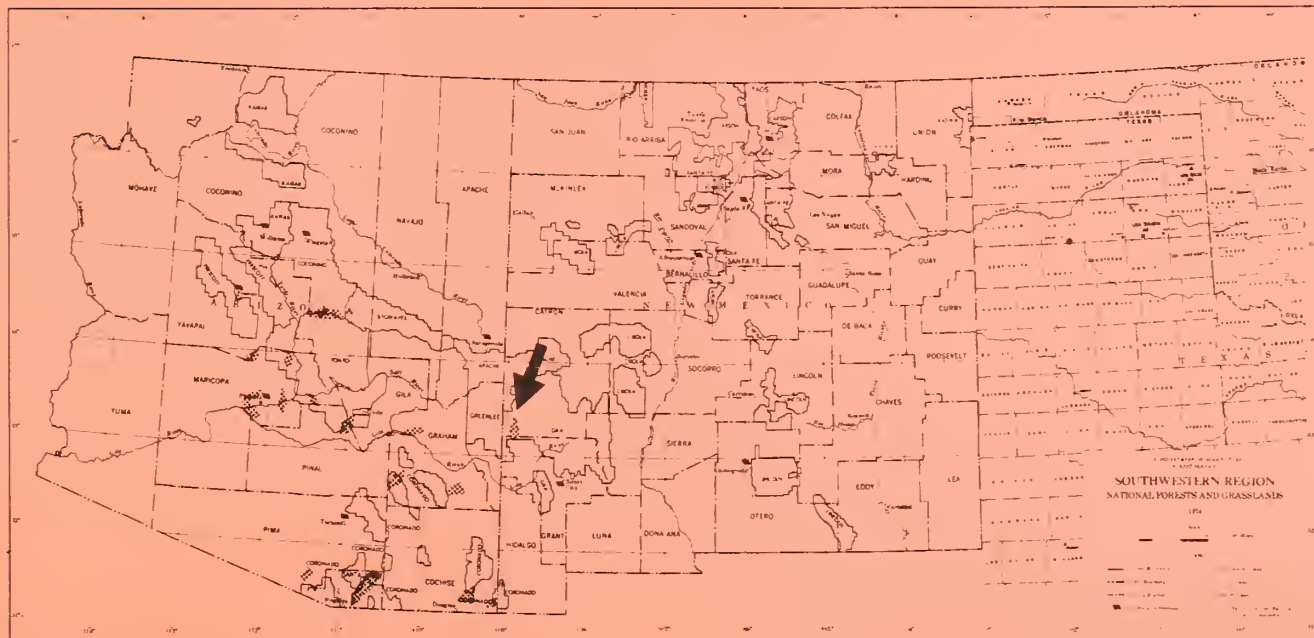
STATUS: Endangered; seriously threatened with extinction. Local populations are large but undergo marked seasonal fluctuations, (Group I, New Mexico)

REGIONAL DISTRIBUTION: An introduced population has been established in the Auga Fria drainage, Prescott National Forest, and in a tributary to the Verde on the Coconino National Forest. A native population has recently been discovered in the Canelo Hills, Coronado National Forest. The species also occurs in five springs or spring-fed streams on private lands in southeastern Arizona.

HABITAT TYPE ASSOCIATION: The topminnow is found in ponds or runs, fed by springs and is usually associated with beds of aquatic vegetation.



Male above, female below



DISTINGUISHING CHARACTERISTICS: The Gila topminnow is a live bearing species related to the popular aquarium species such as guppies and mollies. Males are about 1 inch in length, females 2 1/2 to 3 inches. This is a small fish with large scales, with the dorsal fin well back on the body, originating even with or behind origin of the anal fin. There is a faint lateral band on the side with no crossbars. Caudal fin nearly square, slightly rounded. Coloration is brownish above, dotted with black silvery below. Territorial males are velvety jet black and with little orange spots on sides.

REPRODUCTION: Mating and bearing of young may take place at almost any time of the year although reproductive activity is most intense in spring and early summer. Throughout year in warm springs.

NUMBER OF YOUNG: Gila topminnows seem to be highly productive where undisturbed, because females are carrying multiple broods at different stages of development but broods are relatively small (2 to 16).

FOOD HABITS: The topminnow feed largely on insect larvae. It is as efficient in mosquito control as the mosquito fish Gambusia affinis.

HAZARDS TO THE SPECIES: Competition with Gambusia affinis planted for mosquito control has to a large extent been responsible for disappearance of this species from preferred habitat. Pesticides used for mosquito control also pose a considerable threat to this species. The species is taken easily by all predators.

HABITAT REQUIREMENTS: The species is capable, because of its small size, of utilizing very shallow waters, which warm rapidly, especially in winter. In moving water males are most noticable since they move away from banks when approached; females tend to remain along the margins in quieter water, and young tend to stay close to shallow margins of ponds or hide in thick beds of aquatic vegetation, collectors usually do best finding these fish near beds of aquatic vegetation, behind sandbars, or at the mouth of inflowing washes in quiet backwaters.

PROTECTIVE MEASURES ALREADY TAKEN: In addition to the known remaining sites of natural occurrence, breeding stocks of this native fish are held at Arizona State University, University of Arizona, and the Deer Valley office of the Arizona Game and Fish Department. Several attempts have been made to reestablish this species in different parts of its former range. Some attempts have been successful.

MANAGEMENT PROPOSALS:

1. Cooperate with state game and fish department and state universities in surveys to find existing populations, and to locate suitable habitat for reintroduction.
 2. Participate in reintroduction into suitable areas.
 3. Give this species management consideration in all Forest functional activities which may encroach upon or degrade existing habitat.
 4. Avoid introduction of predaceous fish species.
 5. Protect inhabited spring areas from pumping losses.
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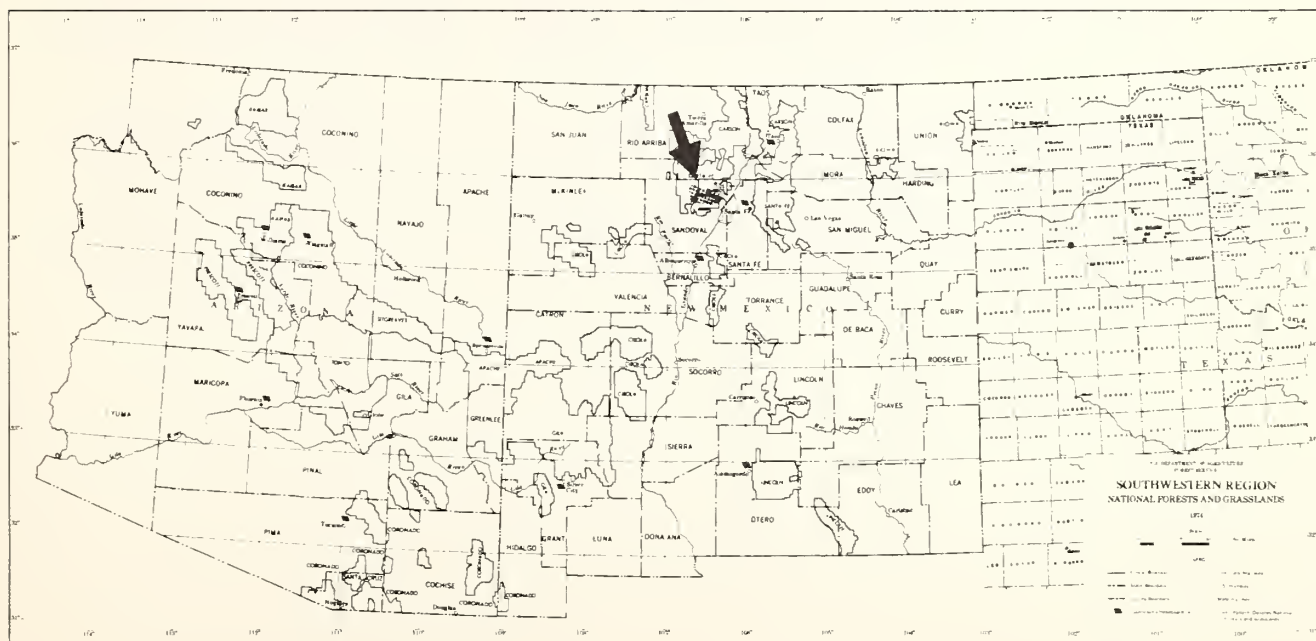
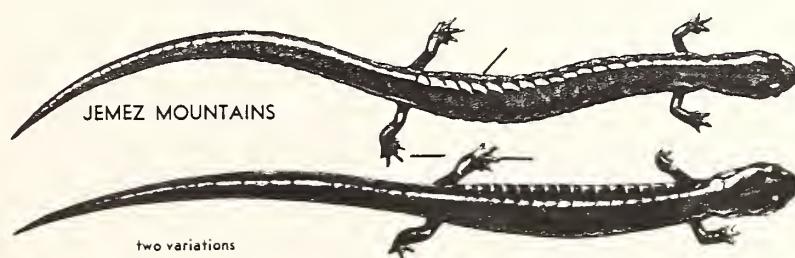
NOTES

JEMEZ MOUNTAIN SALAMANDER

Plethodon neomexicanus (Stebbins & Reimer)

STATUS: Unique; of considerable interest because of its very limited range.
(Group II, New Mexico)

REGIONAL DISTRIBUTION: Known to exist only in the Jemez Mountains of the Santa Fe National Forest.



HABITAT TYPE ASSOCIATION: The habitat is located in the volcanic substratum surrounding Redondo Peak and the Valles Coldera in the Jemez Mountains. The salamander primarily utilizes the north aspect of dense spruce-fir slopes at elevations of 7,900 to 9,200 feet, where shade and moist, decaying logs are prevalent. The edges of openings seem to be preferred during the cool days of early spring and late fall, while the protection of the deeper Forest is sought in the warmer, midsummer period. The presence of volcanic talus which provides crevices for easy vertical movement in response to fluctuating conditions seems to be essential. Winter hibernation takes place in the underground volcanic substrata.

DISTINGUISHING CHARACTERISTICS: This salamander is a small (4 - 5 inches) dark brown, ground-dwelling woodland species. It is very slender and short legged. The brown color of the back is stippled with fine, brass-colored spots. This animal is primarily nocturnal in its habits, and is most active in July and August when surface conditions are quite moist and temperatures are low (51 to 52° F.).

REPRODUCTION: Research has determined that mating occurs in July and August. The eggs are deposited under ground between August and the following spring, probably in April or May, and hatching takes place the latter part of July. Clutch size ranges from 5 to 12 eggs, with an average of 7 or 8 eggs. Females will produce an average of about 8 offspring every other year. To date little is known about rearing of the young. Young apparently stay underground until nearly mature.

FOOD HABITS: It seems likely that the Jemez Mountain Salamander feeds primarily at night and during the summer months. This may be due to the seasonal abundance of insects and other suitable food species. The most frequently taken food is ants, but some kinds of beetles, butterfly larvae, worms, spiders, and small snails are eaten.

HAZARDS TO THE SPECIES: Suspected predators are ring-necked and garter snakes. Laboratory investigations revealed internal nematodes, but these were not thought to be pathogenic. Logging and scientific collecting, can cause habitat destruction which is extremely slow to recover.

HABITAT REQUIREMENTS: Primary habitat requirements seem to be damp, cool, north-facing slopes situated in spruce-fir or mixed conifer vegetative types about 8,000 feet elevation. Although this salamander has an entirely terrestrial life cycle it is totally dependent upon moisture! It has no lungs and must "breathe" through it's skin. The presence of volcanic talus is also a necessary element of the environment. The species can usually be found under rocks and in or under rotting logs.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Santa Fe Multiple Use Guide provides for close liaison with the University of New Mexico to keep abreast of additional information on the species and its habitat requirements.

2. Protection of identified habitat from disturbance until the range of and effect on, the species are determined.

3. Santa Fe National Forest Timber Management Plan stipulates that the range of the species be deleted from timber harvest until proper coordination measures are developed. These are being developed to provide for timber harvest which will be compatible with the requirements necessary for preservation of the species.

4. Protected under the New Mexico Wildlife Conservation Act of 1974.

5. The University of New Mexico and New Mexico State University are doing continuing research on the species.

MANAGEMENT PROPOSALS:

1. Continue life history studies in cooperation with the New Mexico Department of Game and Fish and University of New Mexico to determine the habitat requirements, life history, population levels and distribution.

2. Permit timber sales within the range of the Jemez Mountain Salamander only in accordance with the management practices developed by researchers; i.e. (a) harvest only mature trees; (b) leave cull logs and snags on the ground to add to salamander habitat; (c) minimize movements of heavy equipment and resulting disturbance of topsoil and litter.

3. Give special management consideration to all Forest functional activities to prevent physical disturbance of salamander habitat.

NOTES

SACRAMENTO MOUNTAIN SALAMANDER

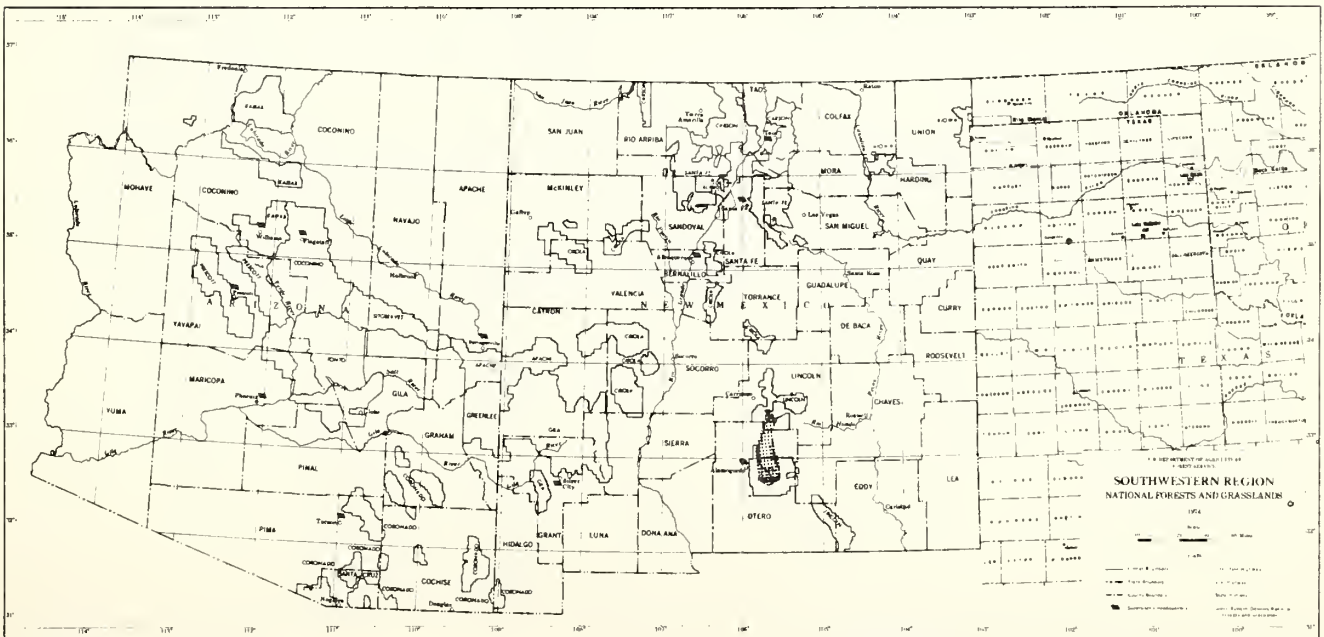
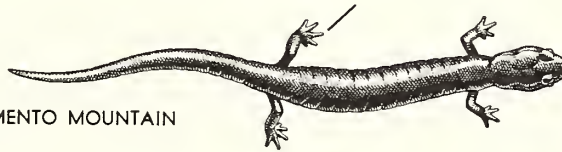
Aneides hardyi

STATUS: Unique; of interest because of its restricted range, (Group II, New Mexico)

REGIONAL DISTRIBUTION: Found only at elevations above 8,000 feet in the Sacramento division of the Lincoln National Forest.

HABITAT TYPE ASSOCIATION: Found in the mixed-conifer and spruce-fir type hiding under bark, under, or within rotting logs or among rockslides and rocky rubble. Surface activity seems to occur primarily during the period of summer rains.

SACRAMENTO MOUNTAIN



DISTINGUISHING CHARACTERISTICS: This is a small, slim-bodied, climbing salamander. The snout to vent length is about two inches or a little more, and the tail is shorter than the body. Overall length is somewhat less than four inches. The base color above is brownish with bronze or gray-green mottling. The belly is lighter with a slaty underside of the tail and a cream-colored throat. The toe tips are rounded but not enlarged. The young salamanders are darker colored and may have a rusty or brown stripe down the back and a white throat.

REPRODUCTION: Only limited knowledge is currently available on the biology of this species. We know only that brooding females have been found with eggs in hollow Douglas fir logs in the summer. The eggs that have been seen were stalked, the stalks twisted together, and anchored at a single base to the upper side of a hollow in a Douglas fir log. They were three in number and were surrounded by envelopes of gelatinous material.

FOOD HABITS: Unknown.

HAZARDS TO THE SPECIES: Unknown

HABITAT REQUIREMENTS: Further research is needed to establish specific habitat requirements.

PROTECTIVE MEASURES ALREADY TAKEN:

1. The Forest Service has entered into a contract with the University of New Mexico to conduct a study of the biology and habitat requirements of this species.

2. Protected by New Mexico regulation.

MANAGEMENT PROPOSALS:

1. Continue life history studies in cooperation with the University of New Mexico and the New Mexico Game and Fish Department to determine habitat requirements, life history, population levels and distribution.

2. Permit timber sales within the range of the Sacramento Mountain salamander only in accordance with the management practices developed by the researchers.

3. Give special management consideration in all Forest functional activities to prevent physical disturbance of salamander habitat.

4. Cooperate with the New Mexico Department of Game and Fish to obtain protected status for this species.

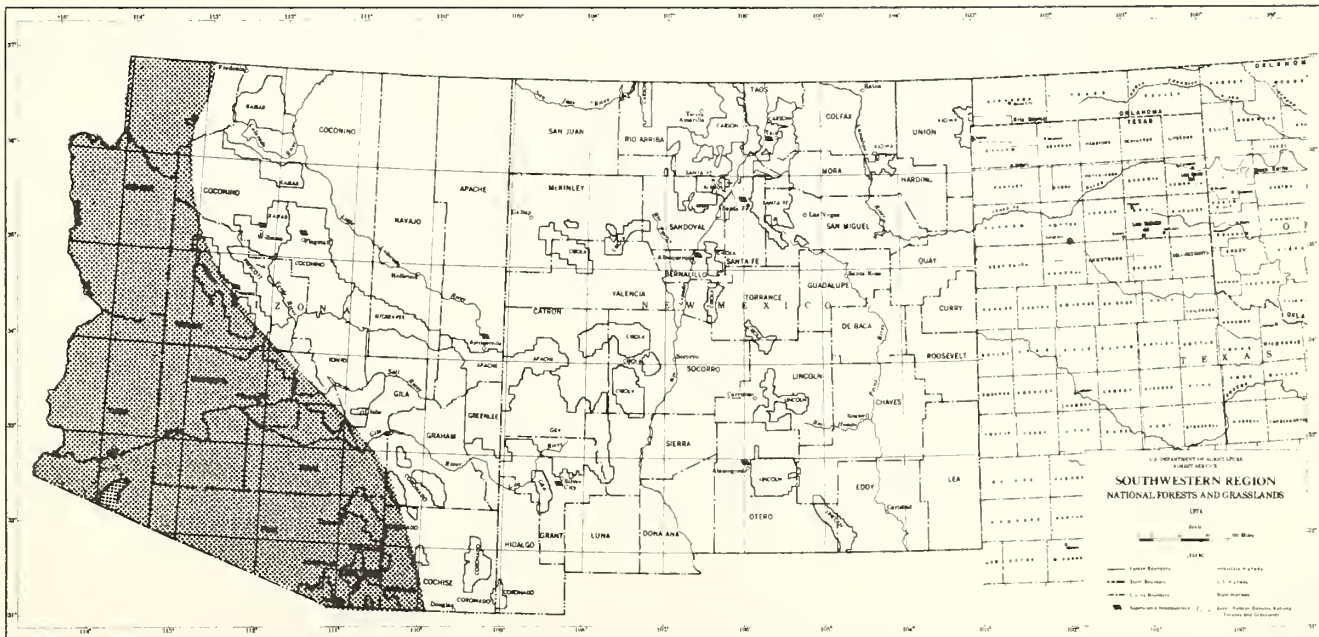
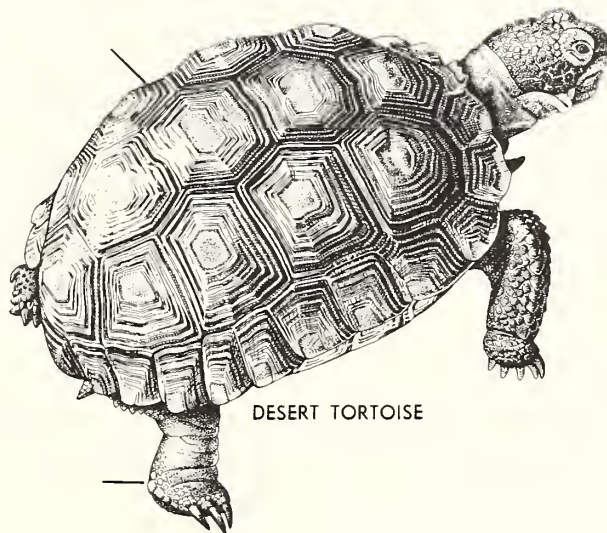
DESERT TORTOISE

Gopherus agassizi

STATUS: Unique; of interest of its adaption to desert type habitat.
(Group II, New Mexico)

REGIONAL DISTRIBUTION: Coronado and Tonto National Forests. Found from southeastern Arizona (near Benson, Cochise County) west to California, north to extreme northwestern Arizona and southeastern Nevada, and south into Mexico.

HABITAT TYPE ASSOCIATION: Frequents desert oasis, riverbanks, washes, dunes, and occasionally rocky slopes. Low vegetation including grass and cacti are necessary for food, and creosote bush is often present in its habitat.



DISTINGUISHING CHARACTERISTICS: This tortoise has a high-domed, brown or horn colored shell, with prominent growth lines on each section or shield of the shell, both upper and lower. The underside of the shell tends to be yellowish in color. This species may reach a length of 13 to 14 1/2 inches. The legs are stocky and elephantine in appearance, with blunt nails and no indication of a web. The tail is short.

Except for the extremely warm days of mid-summer, the Desert tortoise is diurnal in its habits, and is found on flats in the vicinity of "summer holes." During the mid-day heat it rests in the shade of a bush, rock or a burrow. Temporary, summer burrows are 3 to 4 feet long with a floor sloping at an angle of 20° to 40°. More permanent tunnels or "dens," sometimes as much as 30 feet long, are usually horizontal, and dug into banks of washes, or under bushes in dry sites. The tortoise tends to be gregarious and up to 17 individuals have been found in a single den. The range of an individual tortoise may be as much as ten acres or more.

REPRODUCTION: Mating occurs in the spring or occasionally in summer. Eggs are oval in shape or slightly flattened on one side, hard shelled and approximately 1 3/4 inches long. A clutch of eggs are deposited in shallow depressions, three or four inches deep, which the female tortoise digs with her hind feet. Eggs may also be deposited at the mouth of dens. Most egg laying takes place in June. Peak hatching occurs in September and October. Young tortoises are about 1 1/2 inches in length when hatched, have soft round shells which become bony after 5 or 6 years.

FOOD HABITS: The Desert Tortoise is herbivorous, eating leaves, soft stems and fruits. Food consists of such grasses as Red brome, Bromus rubens and mesquite, and blossoms of desert composites such as Encelia. Captive specimens have taken a wide variety of fruit and vegetables. Free water does not appear to be an essential requirement, but they will drink deeply when water is available.

HAZARDS TO THE SPECIES: Increased human predation and physical disturbance of tortoise habitat is responsible for reduced population levels.

HABITAT REQUIREMENTS: The tortoise is a completely terrestrial desert species, requiring firm, but not hard ground for construction of burrows (banks of washes or compacted sands), adequate ground moisture for survival of eggs and young, and grass, cacti, or other low growth for food (creosote brush often present in its habitat). Frequents desert oasis, riverbanks, washes, dunes, and occasionally rocky slopes.

PROTECTIVE MEASURES ALREADY TAKEN:

1. The species is protected by State law in Arizona.

MANAGEMENT PROPOSALS:

1. Cooperate with the Arizona Game and Fish Department and research organization in gathering life history data, including distribution and range, population levels, and nesting sites.

2. Location of nest burrows should be mapped and plotted on Forest wildlife multiple use overlays, and efforts made to preserve nest site ecology. Human activity should be restricted from the area.

3. Management considerations for this species should be given in all Forest functional activities to avoid physical disturbance of tortoise habitat, including nest sites, brush for shelter, and migration routes.

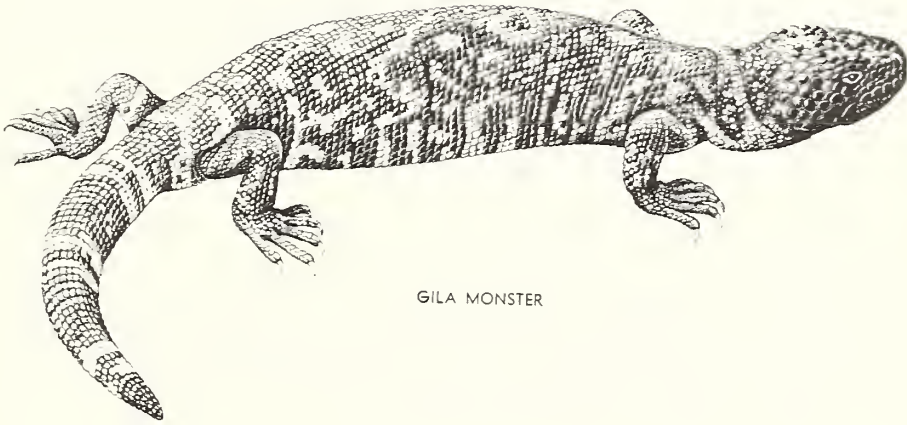
NOTES

GILA MONSTER

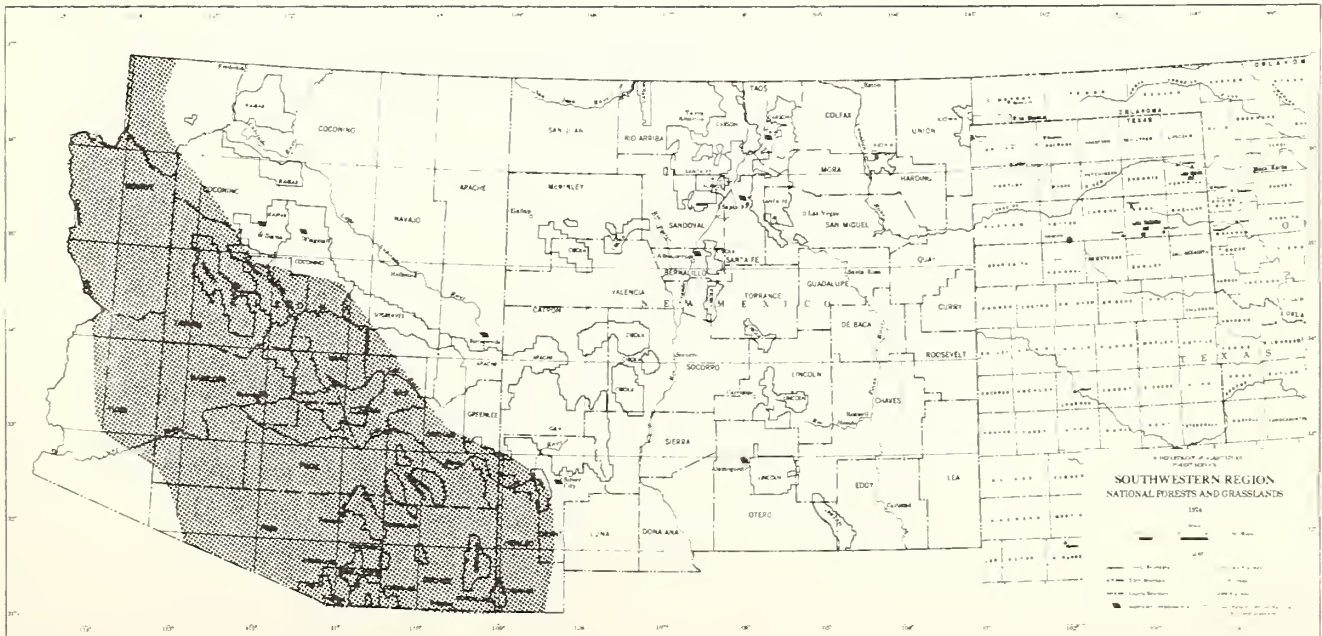
Heloderma suspectum (Cope)

STATUS: Unique; the only known venomous lizard in the United States.
(Group II, New Mexico)

REGIONAL DISTRIBUTION: Coronado National Forest; less frequently on Prescott, Tonto and Gila National Forests. Found in south and west half of Arizona and southwest corner of New Mexico.



GILA MONSTER



HABITAT TYPE ASSOCIATION: This lizard inhabits the rocky areas, desert flats, broad canyons, and arroyos of the arid to semi-arid lower Sonoran Life-Zone. It is in association with creosote bush desert, near mesquite thickets and in the sahuaro-ocotillo vegetative association.

DISTINGUISHING CHARACTERISTICS: This species is a large, thick-bodied lizard with a short, thickened tail, which may reach an overall length of 15 to 21 inches. It may be recognized from the distinctive pattern of spots, bars and dots of salmon pink, orange or buff and blackish brown which mark the rounded, bead-like scales of its back. It has a black, forked tongue, which is snake like in appearance and action. Its appearance is rather awkward, and its pace slow, although it can and will climb into bushes and low trees on occasion.

REPRODUCTION: Time of mating and rearing of young; only incomplete data is available in regard to the reproductive habits of the Gila Monster. Eggs are about 2 1/2 inches long and soft shelled. The eggs are buried in a hole in sand dunes 3 to 5 inches below the surface. Incubation takes about one month, and the young are about four inches long when hatched.

FOOD HABITS: The diet consists of the nestlings and eggs of birds, small mammals, eggs of other reptiles and rarely adult lizzards of other species.

HAZARDS TO THE SPECIES: Exploitation of the habitat and the species by man.

HABITAT REQUIREMENTS: Occurs in rocky foothill terrain, on rocky-gravelly bajadas, and in rocky canyons; less frequent or absent on open sandy desert plains, in desert-grasslands, and lower edge of evergreen woodland plains. Seeks shelter in rodent burrows, woodrat (packrat) nests, dense thickets, and under rocks. In New Mexico areas of rough desert shrubs appear to be preferred.

PROTECTIVE MEASURES ALREADY TAKEN: Protected by State law in New Mexico, and Arizona.

MANAGEMENT PROPOSALS:

1. Cooperate with the Arizona and New Mexico Game and Fish Departments and other reserach organizations in gathering data on distribution, habitat needs and population levels to determine species status.

RIDGE-NOSED RATTLESNAKE

Crotalus willardi

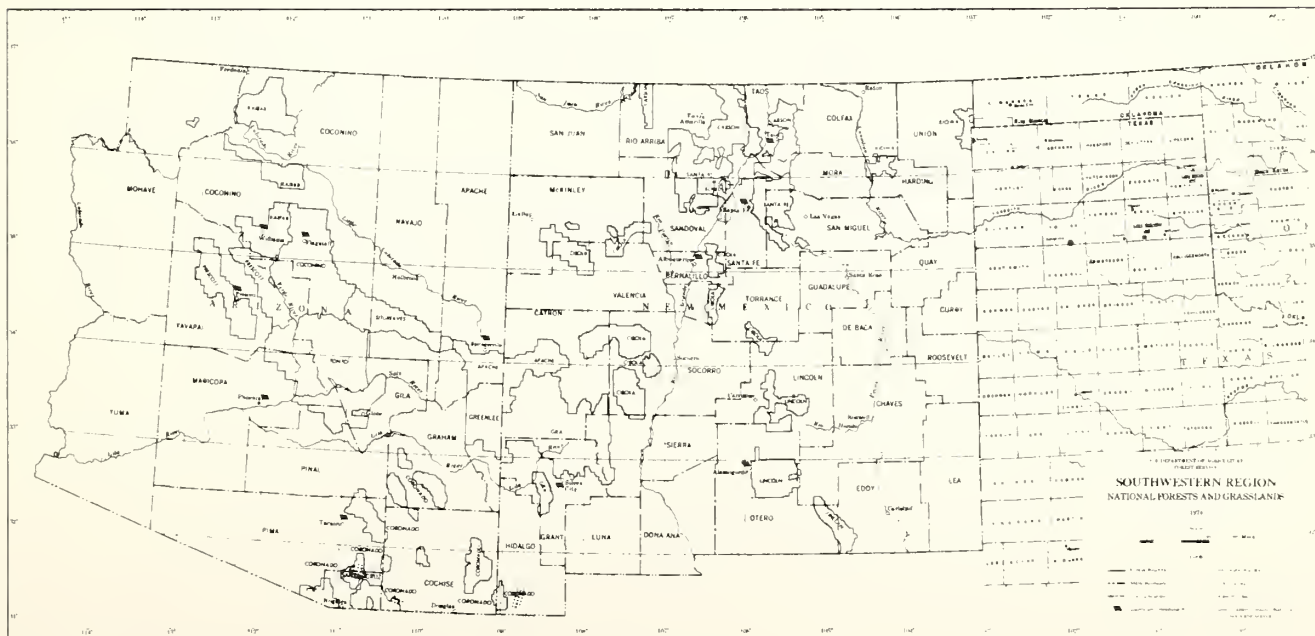
STATUS: Unique; two sub-species, both peripheral in very limited areas in the United States, (Group II, New Mexico)

REGIONAL DISTRIBUTION: Coronado National Forest. The Arizona Ridge-nosed rattlesnake, C. w. willardi, occurs only in Ramsey and Carr Canyons in the Huachuca Mountains and in the Santa Rita Mountains. The Chichuahuan ridge-nosed rattlesnake, C. w. silus, is known in the United States only from a small area in the Animas Mountains at the head of Indian Creek Canyon in extreme southwestern New Mexico. This sub-species is not known to be found on National Forest system lands.

HABITAT TYPE ASSOCIATION: This rattlesnake is found in the high mountain pine-oak and pine-fir belts at elevations of 5,700 to 9,000 feet. Trees found in areas from which this species has been collected include Douglas fir, white fir, limber pine, Arizona White oak, ash and Big-toothed maple.



RIDGE-NOSED RATTLESNAKE



DISTINGUISHING CHARACTERISTICS: A medium-sized rattlesnake 1 1/2 to 2 feet in length when mature. The ground color of the upper side of this rattler may be reddish, brown or gray with narrow whitish, buff or light gray cross bars edged with black or dark brown which merge into the color of the sides. A white or light gray line bordered with brown extends along the side of the face from the nostril to the angle of the mouth. Sub-species are separated by a vertical white strip on the snout which runs through the central scale both above and below the mouth. This mark is present on the Arizona ridge-nosed and absent on the Chihuahuan ridge-nosed sub-species. Definitive of both sub-species is the ridge bordering each side of the snout formed by the titled inter-nasal scales. This snake does not always coil to strike as other rattlers do, but may turn and bite in the same manner as copperheads and moccasins.

REPRODUCTION: Only limited data is available on the life habits of this species. Like other rattlers, the ridge-nosed is a live bearing species, and may have two to six (possibly more) young, which are about 5 1/2 to 7 1/2 inches in length at birth.

FOOD HABITS: This snake is thought to feed on lizards and small mammals. Lizards are most likely taken more frequently by juveniles.

HAZARDS TO THE SPECIES: Indiscriminate killing and collecting are thought to be a major threat to this species.

HABITAT REQUIREMENTS: This is a mountain species which occurs principally in the Transition Live-zone. Indications are that the preferred habitat is the moist woodland and Forest, where the ridge-nosed rattler is prone to bask on well-illuminated, rocky slopes, and canyon bottoms containing broad leaf deciduous trees.

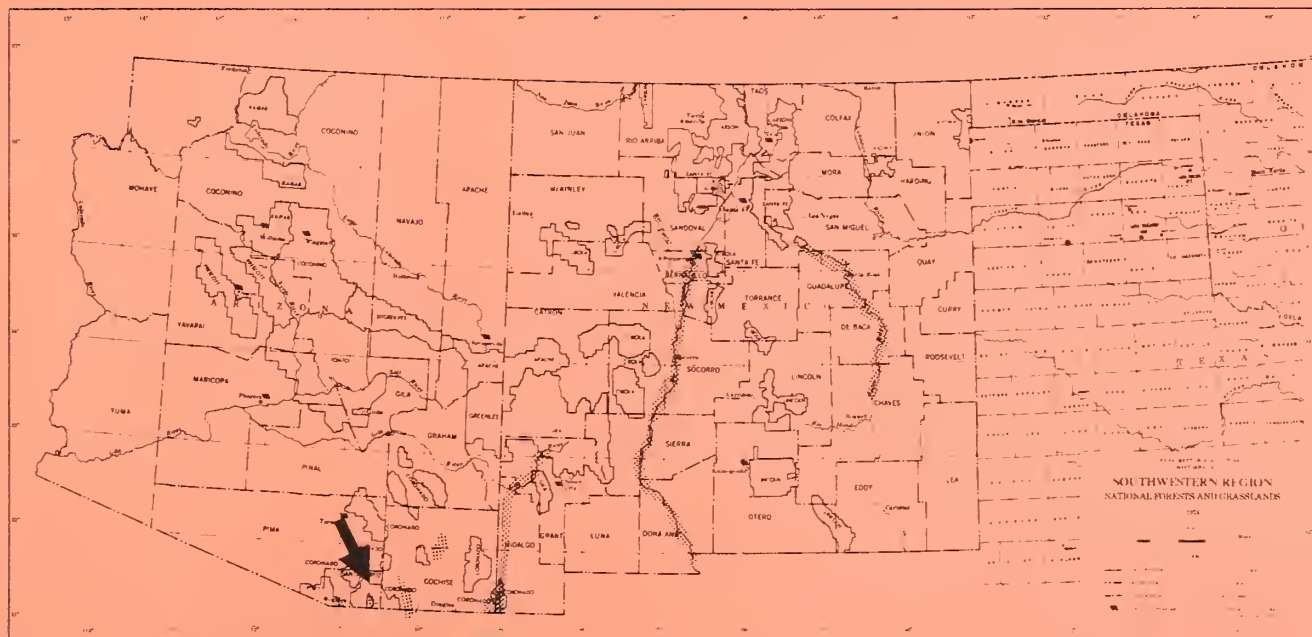
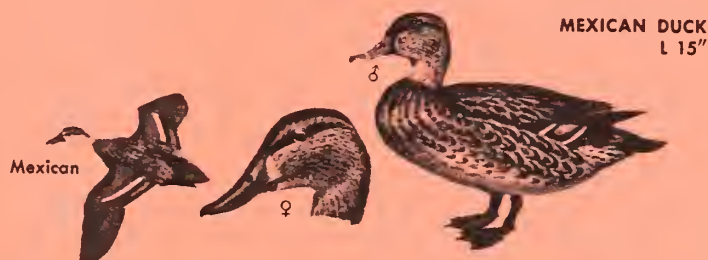
PROTECTIVE MEASURES ALREADY TAKEN:

1. Protected by State law in both Arizona and New Mexico.
2. Habitat protection provided on the Coronado National Forest.

MANAGEMENT PROPOSALS:

1. Cooperate with Arizona Game and Fish Department and reasearch organizations in gathering life history data, including distribution and range, population levels, and habitat requirements in order to determine species status.

MEXICAN DUCK

Anas diazi (Ridgway)STATUS: Endangered, (Group I, New Mexico)REGIONAL DISTRIBUTION: Possibly Coronado and Gila National Forests. Thought to be a casual (non-breeding) summer visitor only in the Gila River valley in the Burro Mountains on the Gila National Forest.HABITAT TYPE ASSOCIATION: Found on fresh marshes, rivers, lakes, ponds, irrigated lands and grain fields. Occurs in localized areas in southeastern Arizona and southwestern New Mexico.

DISTINGUISHING CHARACTERISTICS: A large dabbling duck, both sexes closely resembling a female mallard, with a white and black border on both sides of the metallic blue-purple speculum. The male has an unmarked yellowish-green bill characteristic of the male mallard. The female has unspotted orangish bill, but with a dark ridge instead of being spotted like a female mallard. Other subtle differences in coloration of plumage from that of the female mallard exist, but may be hard to distinguish in the field. This is especially true since this species readily hybridizes with the mallard and a variation in the marking of the plumage occurs. The yellowish-green bill of the male coupled with plumage resembling the female mallard seems to be the best identifying field mark.

REPRODUCTION: March through October. Nests are placed among the reeds or rushes above shallow water. Nest made of water soaked grasses and dry blades of rushes. Eggs white with a greenish-blue cast. Various observers have reported seeing broods of 5 to 7 young.

FOOD HABITS: This duck is a typical "pond duck," with feeding habits very similar to the mallard. Ponds, swamps, rivers, and ditches are feeding areas as well as flooded alfalfa fields.

HAZARDS TO THE SPECIES: As far as is known this species is no more or less subject to predation than other pond ducks. One problem with maintaining the species is its tendency to interbreed with mallards. There is some evidence to indicate this duck may also experience some difficulty in bringing off a successful hatch. However, recent observations by New Mexico State University researchers refute this finding.

HABITAT REQUIREMENTS: This species is thought to have habitat requirements similar to the mallard. This is a very shy duck, and seems to be much more wary and suspicious than the closely related mallard. They seem to prefer the cover of dense, rank grasses, sedges, and rushes for their nesting areas. However, dense cover seems to be required only for nesting, young birds, and during the flightless late summer molt. At other times they seem to prefer areas with adequate open water to provide good visibility of nearby surroundings.

PROTECTIVE MEASURES ALREADY TAKEN:

1. On the United States List of Endangered Fauna (May 1974).
2. Protected by the New Mexico Wildlife Conservation Act of 1974.
3. The development of habitat on refuges is being done by the Arizona and New Mexico Departments of Game and Fish and the U. S. Fish and Wildlife Service.
4. Restocking of former breeding areas using birds produced in captivity from brood stock held at the Bosque del Apache National Wildlife Refuge.
5. Restoration of habitat at San Simon Cienega by the Bureau of Land Management.
6. A recovery team has been established.

MANAGEMENT PROPOSALS:

1. Conduct interagency field surveys and determine the amount of available habitat present. Record all observations of the species and particularly note type of habitat preference displayed.

2. Stock suitable habitat in cooperation with the State Department of Game and Fish, and the U. S. Fish and Wildlife Service.

3. Initiate habitat improvement projects in areas of known Mexican Duck occurrence if needed.

4. Protect known nesting areas from all forms of disturbance during the rearing season (March to October).

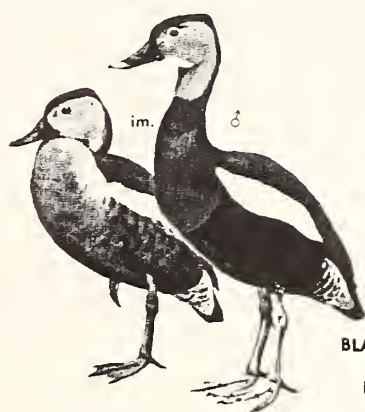
NOTES

BLACK-BELLIED TREE DUCK

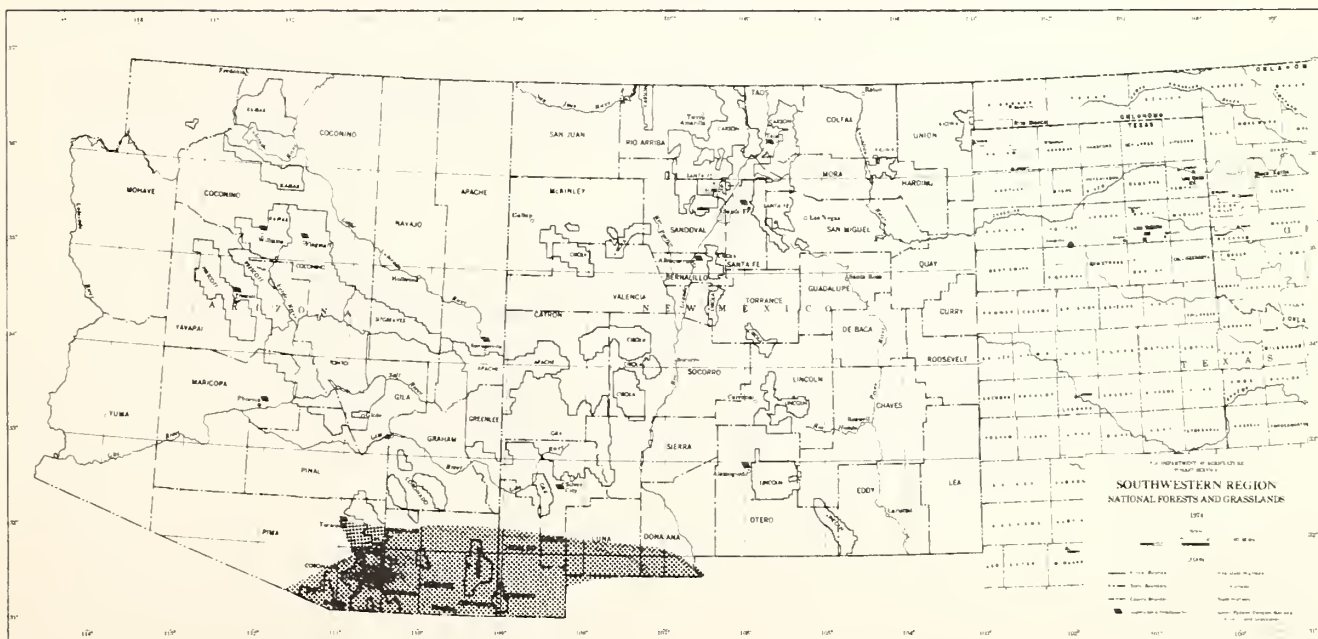
Dendrocygna autumnalis (Linnaeus)

STATUS: Unique, of interest as a peripheral species occurring at the northern limit of its natural range.

REGIONAL DISTRIBUTION: Rare and sporadic occurrence has been recorded in southeastern and central Arizona, where nesting has taken place near Tucson, Hereford, San Pedro Valley, and Nogales. The species is also a casual summer visitor to the Gila River Valley north of Redrock near the Gila National Forest.



BLACK-BELLIED
TREE DUCK
L 13" W 37"



HABITAT TYPE ASSOCIATION: This species is an inhabitant of ponds, fresh marshes, lakes, and rivers. It frequently perches on the branches of trees, or on cornstalks, when feeding in the cornfield of its native Mexico.

DISTINGUISHING CHARACTERISTICS: This is a long legged, long necked duck which more nearly resembles geese. It can be recognized by its cinnamon colored upper parts, black belly and long pink legs. The white wing patches are conspicuous in flight, and the characteristic long legs extend beyond the tail. They utter a distinctive whistling call in flight described by the syllables "pe - che - che - ne."

REPRODUCTION: The nest of the tree duck may be in a cavity of a tree, a branch fork, or on the ground hidden in the grasses, rushes or reeds, and may be at a considerable distance from water. The nesting season is quite long and it is possible that two broods may be raised in a single season. A clutch consists of 12 to 16, white or cream colored eggs with no spots or marks. The males may participate in incubation, but this has not been positively established. The downy young are readily recognized by the yellow underparts, black back and head markings which consist of a black crown, yellow stripe above eye, black line through the eye and a broad yellow band from the base of the bill through the cheek to the back of the head.

FOOD HABITS: Little is known of the feeding habits of this species. They are known to eat both fresh and dried corn, perching on stalks when necessary to reach ears. They are not inclined to feed much during the day. When they do feed in daylight hours they wade in the shallow water at the edge of the marsh or lagoon.

HAZARDS TO THE SPECIES: Unknown

HABITAT REQUIREMENTS: These ducks seem to prefer shallow water at the edges of ponds or marshes or dry ground. They select sites where the shallow water is densely bordered with woods or water flags. Trees with hollows suitable for nesting are a desirable part of the habitat. These ducks seldom land in, or use deep water.

PROTECTIVE MEASURES ALREADY TAKEN: The species is protected under the Migratory Bird Treaty Act but is presently legal game during the waterfowl seasons in Arizona and New Mexico.

MANAGEMENT PROPOSALS:

1. Initiate and/or participate in joint studies with Arizona Game and Fish Department, state universities or interested private organizations and individuals to determine presence, distribution, numbers and life history data.
2. Where suitable habitat exists, or can be established, consider waterfowl habitat improvement programs to attract and benefit the species..

3. Be alert to possible presence of the species and record observations including date, place, number, habitat being used, whether adult or immature, and feeding or behavior characteristics. Nesting records, with details are of particular interest.

4. Within the limit of the known natural range, consider planting corn near suitable shallow water areas, with accessible wooded areas suitable for nesting, in an effort to attract nesting pairs.

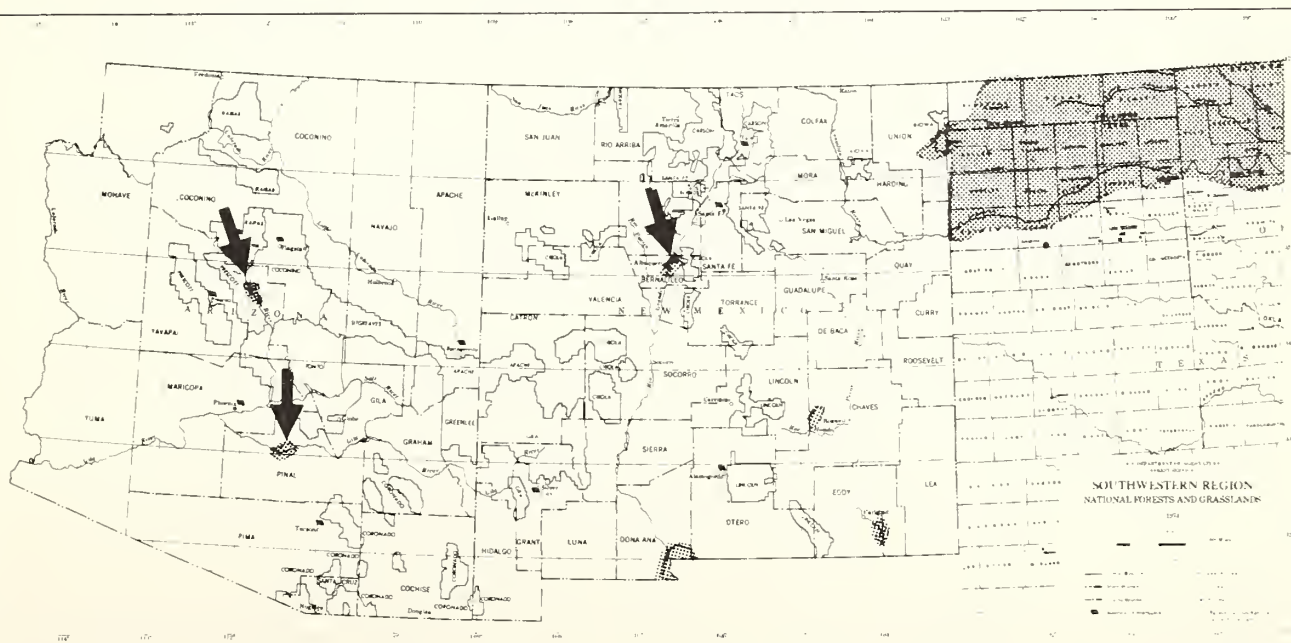
NOTES

MISSISSIPPI KITE; GRASSHOPPER HAWK

Ictinia mississippiensis (Wilson)

STATUS: Unique; range is thought to be shifting west so that this species is now sighted more frequently in the eastern part of Region 3. (Group II, New Mexico)

REGIONAL DISTRIBUTION: Cibola National Forest, Prescott, and Coconino National Forests along the Verde River. The breeding range includes the panhandles of Texas and Oklahoma and the plains area of eastern New Mexico. Breeding pairs have been observed along the San Pedro River near Winkelman, Arizona, since July 1970. One adult female with one fully developed egg was taken in June 1973 near Camp Verde, Arizona.



HABITAT TYPE ASSOCIATION: The species is a bird of tall trees and of the air, catching and eating most of its prey in flight. Formerly a bird of the open savannahs, this kite is being forced to shift into agricultural areas, parks, and the fringes of towns as a result of extensive vegetative control activity in its historical range.

DISTINGUISHING CHARACTERISTICS: A medium-sized, Falcon-shaped hawk with pointed wings and a long tail. It soars rather than using the strong, rapid wingbeats of the falcons. This is the only falcon-shaped hawk with an unbarred, black tail. The species is dark above, light below, with a light gray head and a bluish white breast shading to gray on the belly. The wing tips are dark. The trailing edge of the secondary flight feather are white as seen from both above and below. Immature birds have the typical falcon-like shape, and the tail is dark but banded below; heavy brown longitudinal streaking is present on the belly and underparts.

REPRODUCTION: The total nesting range of the Mississippi Kite is thought to be decreasing rapidly. This species nests in green trees, sometimes mesquites 8 to 10 feet above the ground, but not in brush. The nest is made of twigs and small sticks and is lined daily with green leaves. Normally two eggs are laid, but a nest may sometimes have as many as three. The eggs are plain white or bluish white. The incubation period is 31-32 days. Both parents participate in the incubation and care of the young. Nesting success appears to be less than 50 percent. Overwinter loss of fledged juveniles also seems to be quite high.

FOOD HABITS: The food of the Mississippi kite consists almost exclusively of insects, principally grasshoppers and cicadas. Insects are often held in the claws and eaten while the bird is flying. The species is considered beneficial to mankind.

HAZARDS TO THE SPECIES: Much of the historic breeding habitat of this species has been destroyed by agricultural clearing. There may also be a certain amount of secondary poisoning from eating insects contaminated with insecticides. The species is also frequently mistaken for the more destructive "blue darter" and therefore shot, despite protection of state and Federal law. Directly or indirectly man and his activities are the greatest hazard to survival of the species.

HABITAT REQUIREMENTS: The requirements of these birds are not fully known or understood. Recent research indicates that breeding colonies of six to a dozen birds make use of shelterbelts, windbreaks, riparian woodlands, or even trees in towns and on abandoned farms. Mesquite woodlands provide islands of suitable nesting habitat which may have facilitated the westward spread of the species in recent years.

PROTECTIVE MEASURES TAKEN TO DATE:

1. Protected by the New Mexico Wildlife Conservation Act of 1974.
2. Protected by the Migratory Bird Treaty Act.

MANAGEMENT PROPOSALS:

1. Participate with New Mexico Department of Game and Fish, State universities, Audubon societies and other interested parties in gathering life history information, especially distribution, population levels, nesting sites and habitat requirements.
 2. Give special consideration to the needs of this species in all Forest functional activities. This is especially important in regard to proposed range brush control and insect control projects.
 3. Maintain suitable habitat and protect known nesting sites from all forms of disturbance.
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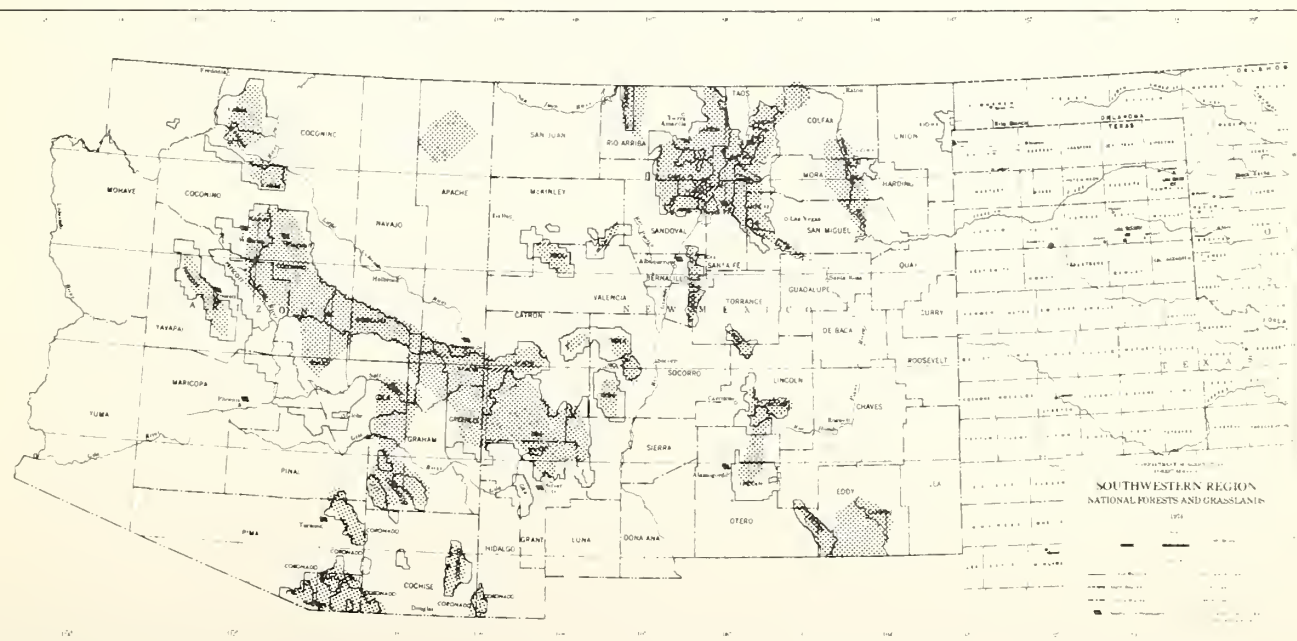
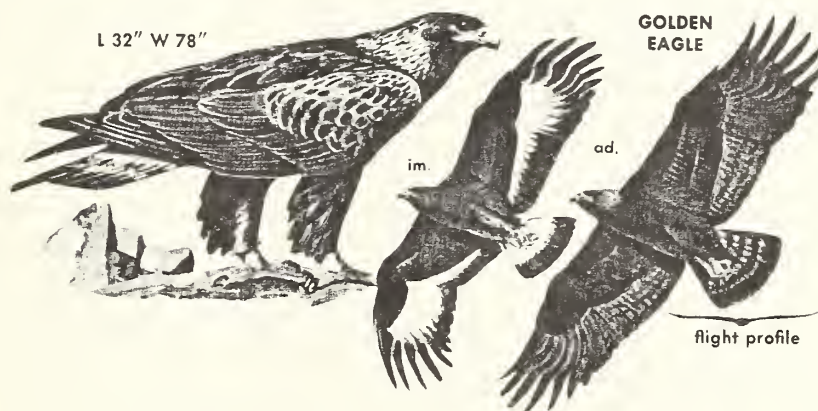
NOTES

GOLDEN EAGLE

Aquila chrysaetos (Linnaeus)

STATUS: Unique; of interest because of apparent decrease in numbers throughout its range.

REGIONAL DISTRIBUTION: Occurs locally but not commonly on all Forests in the Region. An inhabitant of the high mountains, this species ranges throughout the northern hemisphere. The distribution in summers is geared to locating suitable nesting areas. The species is seen more frequently during migration and in wintering areas.



HABITAT TYPE ASSOCIATION: The golden eagle tends to nest on high treeless mountain crags, but hunts over a wide area including several vegetative types.

DISTINGUISHING CHARACTERISTICS: The adult is a large, dark-colored bird, with no white showing anywhere. In good light golden brown hackles are visible on the hind neck. This bird has the typical flat winged soaring profile of the eagles which distinguish it from the dihedral wing pattern of the soaring turkey vulture. It has longer wings and is much larger than any of the broad-winged hawks. Young birds have a white tail with a broad, dark band at the tip and a white patch visible at the base of the primaries in flight. Less readily distinguishable is the presence of feathers on the legs, down to the toes, which is not true of bald eagles.

REPRODUCTION: The preferred nesting site of golden eagles is in a pothole or crevice on a cliff, with a good view of the surrounding area, and at an inaccessible height. If no such site is available, the nest will occasionally be built in a tall tree. The nest is made of large sticks, two inches or more in diameter, and interwoven with smaller twigs, roots or vegetative material. It will usually be lined with some sort of vegetative material. Frequently green material is added from time to time during incubation and rearing of young birds. Often alternative nests are built and used in alternate years or when loss of a first set of eggs is followed by a second set in the alternate nest. A set usually consists of two eggs, but may vary from one to three or rarely four. Egg color varies from dull white to pinkish or buff-cream, and they may be blotched, spotted or dotted with various shades of brown. The reported incubation period varies from 28 to 35 days. The male eagle does not assist in incubation but does feed the female on the nest. The male also brings food to the nest for the young, which are usually fed by the female. The incubating bird is easily frightened from the nest and, in early stages, may abandon the eggs. Young birds probably are not abandoned. Quite often the smaller, weaker eaglet dies or becomes the victim of sibling fratricide. Full juvenile plumage develops in about 10 weeks, and the young eagle is ready to fly.

The young birds remain close to the nest for sometime after fledging. They are probably at least three months old before they are fully able to fly. The adult birds continue to partially feed the fledged eaglets and to watch and guard over them until they are fully able to hunt for themselves in the early fall.

FOOD HABITS: In contrast to the bald eagle, the golden eagle subsists largely on the flesh of mammals. In some area, the diet consists largely of rabbits and ground squirrels, but a wide variety of mammals, even up to lambs, kids and fawns may be taken as well as some birds including occasional song and game birds.

HAZARDS TO THE SPECIES: Because of the difficult accessibility of their nests, golden eagles do not seem to be victims of very many predators. Human activity, especially shooting of eagles in the mistaken belief that they are serious predators on livestock, direct and secondary poisoning and adverse effects of pesticide-induced egg shell thinning, and to some extent electrocution in connection with perching on electric line towers or poles are threats to the golden eagle population. Nest molestation or disturbance during incubation and early rearing of young as well as habitat alteration may also have a negative influence.

HABITAT REQUIREMENTS: Suitable nesting sites in mountainous areas, coupled with an adequate supply of prey species and non-disturbance of nesting areas during the incubation and early stages of rearing young would seem to fulfill the requirements of this species.

PROTECTIVE MEASURES ALREADY TAKEN:

Protected by the Bald and Golden Eagle Act of 1972.

MANAGEMENT PROPOSALS:

1. Initiate and participate with public and private researchers in studies to further establish distribution, population status, breeding, biology and limiting factors for the species.
2. Continue Forest surveillance, but not disturbance, of nest sites to determine active use. Map and plot all nest sites on Forest wildlife multiple use overlay. Do not give publicity to known nesting sites!
3. Continue interagency cooperation in eliminating harmful pesticides (chlorinated hydrocarbons) from the environment.
4. Give management consideration in all Forest functional activities to prevent physical disturbance of nesting sites. Known areas of nesting should be preserved and managed for eagle use. Give special emphasis to eagle nesting and feeding requirements in timber and fire management programs and in proposed projects involving use of pesticides and/or herbicides.
5. Efforts should be made, during Forest logging operations, to retain selected over-mature pine trees or snags in eagle areas which could be used as nesting or resting trees.
6. Restrict all forms of human activity from eagle nesting areas during the period of incubation and when eaglets are very small--probably March through June.
7. Establish an I&E program to educate the public, especially hunters, on how to identify golden eagles in all plumages, how to distinguish between species of eagles and similar hawks and vultures, and to encourage them to refrain from shooting raptors of any species.

REGIONAL DISTRIBUTION: The southern race of the species nests along the Verde and Salt Rivers on the Prescott, Coconino, and Tonto National Forests in Arizona. More active wintering areas for northern races of the species include the entire Mogollon Rim country from the Kaibab to the Apache-Sitgreaves National Forests.

Up until the late 40's Bald Eagles nested along the Canadian River visiting portions of the area that are now National Grasslands.

HABITAT TYPE ASSOCIATION: Uncommon resident around lakes, reservoirs, and rivers. Suitability of individual trees for nesting and perching and accessibility to water appear to have more influence than vegetation type on selection of nesting areas.

DISTINGUISHING CHARACTERISTICS: The adult bald eagle is easily distinguished from other large birds of prey by the clear white head and tail. Juveniles are frequently confused with adult or juvenile golden eagles. The lower leg (tarsus) of the bald eagle is bare while it is feathered to the toes in the golden eagles. The juvenile golden eagle has a broad white band at the base of the tail, which is not present in juvenile bald eagles. Juvenile golden eagles have white patches visible on the underside of the wings in flight. The juvenile bald eagle does not have white patches, but the underwing coverts are mottled with white. It takes about 4 or 5 years for a bald eagle to reach full adult plumage.

REPRODUCTION: To a great extent the life of the bald eagle centers around the nesting territory. Eagles nest in trees and on cliffs. Different species of trees are preferred in different parts of the eagle's range but characteristically the selected nest tree is the largest or stoutest in the immediate area. Nests are most frequently built in live trees although they may be green trees with dead tops and, on occasion, may be built on a cliff or bluff near water. Most bald eagle nests are within one-half mile or less of water. The nest is a large platform of sticks lined with finer material such as dried grasses or herbs and may be reoccupied each year for several years. Rebuilding or adding to existing nests occurs every year, so the structure may become as much as eight to 12 feet high and nearly as broad. Eagles apparently mate for life but may not breed every year. The usual clutch size is two eggs; eggs are comparable in size to domestic goose eggs. The incubation period is approximately 35 days, and both parents participate in both incubation and feeding of the young birds. The female, however, broods the young birds more frequently. Wing flapping exercises begin when the young birds are about a month old and continue until the initial flights are made at about 2 months of age. The young frequently return to the nest at night for several weeks. They may associate with their parents in their home territory during the first summer but are eventually driven off to exist on their own.

FOOD HABITS: The preferred food of bald eagles is fish when available. However, the species is adaptable and will subsist on carrion, particularly small road killed mammals. The bald eagle is capable of catching and killing small mammals and water birds and will frequently supplement their diet with these species. Although frequently accused, bald eagles seldom prey upon domestic animals. Size alone of most of these would prevent such action. However, they will eat the flesh of such animals which have died from other causes.

HAZARDS TO THE SPECIES: In spite of protection of both bald and golden eagles by Federal law and stiff penalties for violation, the major mortality factor is shooting. This may be partly due to mistaken identification of juvenile bald eagles which are believed to be hawks, for the largest toll is immature birds. Reduced reproductive success as a result of pesticide compounds (DDT and DDE) ingested through the food chain has seriously affected eagle populations.

HABITAT REQUIREMENTS: The key requirements for bald eagles are related to nesting territory, a primary factor in eagle behavior. Different species of trees are selected in different portions of the range, but the preferred trees are the tallest in the stand. Proximity to a body of water, where fishing activity may take place also seems to be essential. In most cases, eagles nest within one-half mile or less of such bodies of water. Preferred nesting areas also afford a clear view of the surrounding area. Live trees are preferred for nesting and a relatively uniform stand with plenty of good perching or resting trees near the nest area seems to be an important factor. Nesting territories for individual pairs of eagles average about 57 acres in size but varied from 28 to 112 acres for the particular group of nests studied.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Protected by the Bald and Golden Eagle Act of 1972, The Endangered Species Act of 1973, and the New Mexico Wildlife Conservation Act of 1974.
2. Ecological studies are being conducted by the U. S. Fish and Wildlife Service and the National Audubon Society.
3. Active nationwide I&E programs are alerting the public to the problem of declining eagle populations.
4. Protection from human disturbance of known nesting sites on various Forests in the Region.
5. General discontinuance of the use of pesticides (chlorinated hydrocarbons) which have adverse effects upon the species.

Management proposals:

1. Initiate and participate with State game and fish departments and the U. S. Fish and Wildlife Service in obtaining more information on distribution, population status, breeding biology and limiting factors.
2. Continue surveillance of nest sites to determine active use. All nest sites should be mapped and plotted on the Forest wildlife multiple use overlay. No publicity should be given to known nesting sites!
3. Continue interagency cooperation in eliminating chlorinated hydrocarbons from the environment.

4. Give management considerations in all Forest functional activities to prevent physical disturbance of nesting sites. Known areas of nesting should be preserved and managed for eagle use. Give special emphasis to eagle nesting requirements in timber and fire management programs and in proposed projects involving use of pesticides or herbicides, including chemical control of rough fish.

5. Efforts should be made, during Forest logging operations, to retain selected over-mature pine trees or snags, in eagle areas which could be used as nesting and perching or loafing trees.

6. Protect bald eagle nesting areas from all forms of human activity during the period of incubation and when eaglets are very small probably March through June.

7. Establish I&E programs to educate the public, especially hunters, in how to identify bald eagles in all plumages, how to distinguish them from golden eagles and hawks, and to encourage them not to shoot raptors of any species.

8. Carry on an active pollution abatement program where contamination by domestic or industrial pollutants degrades quality of water or contaminates fish.

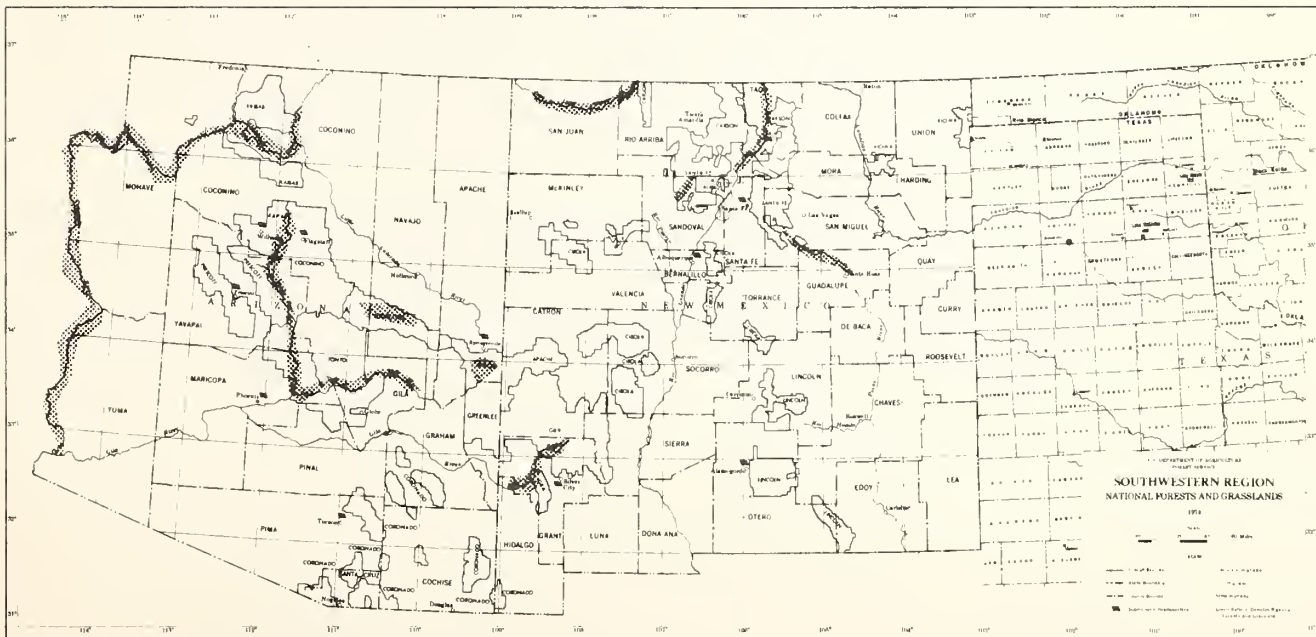
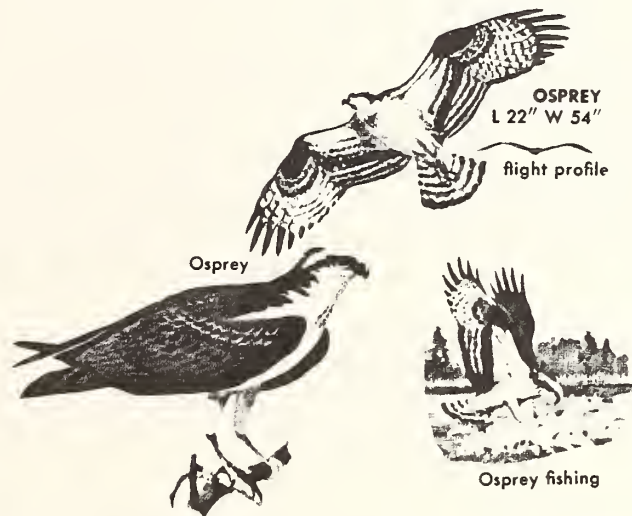
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OSPREY; FISH HAWK

Pandion haliaetus (Linnaeus)

STATUS: Unique; of interest because of steadily declining population.
(Group II, New Mexico)

REGIONAL DISTRIBUTION: Apache-Sitgreaves, Tonto and Gila National Forests and possibly the northern Forests. Almost cosmopolitan, this species breeds from Alaska to Mexico and is found rarely but locally in northern and central Arizona and New Mexico.



HABITAT TYPE ASSOCIATION: This rare visitor occurs near rivers, lakes, and reservoirs. Suitable nesting sites (primarily snags) near an available and abundant food source (fish) are the primary requirements. These may occur throughout a wide range of vegetative types.

DISTINGUISHING CHARACTERISTICS: This large white breasted hawk with a white head and dark mask through the eye is easily recognized. The bending of the wings at the wrist and black wrist marks make it easy to distinguish the species in flight, both from eagles and the smaller, broad-winged hawks.

REPRODUCTION: Nests are large, bulky platforms of sticks and debris usually built in the top of tall dead trees near water. They are reoccupied and added to year after year. Eggs are highly colored and variable in appearance from whitish to reddish and may be heavily marked or spotted with brown. The usual number of eggs is three, but may vary from two to five or very infrequently more. Eggs are usually laid at one or two day intervals during late April or early May. Authorities disagree on incubation period but it appears to be between 38 and 42 days. The incubation is done primarily by the female, who is fed on the nest by her mate. Both parents share in feeding the young. Young ospreys are completely feathered in about 6 weeks. They spend much of the fifth and sixth weeks exercising their wings and may take their first flight at 7 to 8 weeks. However, they continue to return to the nest for sleeping and eating for another 4 or 5 weeks.

FOOD HABITS: The osprey subsists almost exclusively on fish from which it derives the common name of fish hawk. Many species of both game and rough fish are eaten and almost invariably they are caught and eaten fresh. The osprey is not an eater of carrion like the eagle and will not touch a tainted fish.

HAZARDS TO THE SPECIES: Undoubtedly, there is a certain amount of predation on eggs and young birds by crows and possibly herons. Nesting success is low; mortality of young ospreys is high, few reaching maturity at 3 years of age. The average length of life for mature birds is only 4.8 years. These birds probably also suffer from the adverse effects of concentration of pesticide residues at the top of the food chain, resulting in decreased success in producing young. Human activities including disturbance of nests and nesting areas, shooting, and pollution of fishing waters also have a negative influence on the perpetuation of this species.

HABITAT REQUIREMENTS: Suitable nesting sites, protected from human disturbance and located near an abundant source of suitable food appear to be the main habitat requirements. Standing dead trees in or near the water are needed for both nesting and "pilot" trees where the male osprey perches when not assisting with feeding. Dead or spike top trees near nesting sites are also needed for resting and feeding trees.

PROTECTIVE MEASURES ALREADY TAKEN:

1. An active nest site on the Apache-Sitgreaves National Forest has been afforded protection through establishment of a special management unit.
2. Protected by the New Mexico Wildlife Conservation Act of 1974.
3. Protected under the Migratory Bird Treaty Act.

MANAGEMENT PROPOSALS:

1. Initiate studies on the species with emphasis on inventory and protection of nesting sites and population levels and distribution. Do not publicize known nesting sites!
2. Participate in interagency studies of migration patterns of ospreys.
3. Cooperate with state game and fish departments in enforcement of protective legislation.
4. Establish osprey management areas to preserve and protect known nesting sites.
5. Establish standard coordinating practices and prepare standard clauses for inclusion in timber sale contracts which will provide for preservation of osprey habitat in known or potential nesting areas. This should include: no cutting zones or strips and preservation of snags, spike-top trees, and large over-mature trees for nesting and roosting.
6. Coordinate preattack fuel management activity with osprey habitat requirements.
7. Regulate recreation use to prevent undue disturbance of osprey nesting areas by human activities.
8. Consider the possible adverse effect on ospreys in planning of all programs or projects involving the use of herbicides or pesticides.
9. Consider effect on ospreys before carrying out programs for chemical control of rough fish populations.
10. Give species management consideration in all other Forest functional activities to prevent encroachment and disturbance of osprey nesting areas.
11. Conduct an active I&E program to educate the public to the need for reducing human harassment for preservation of this species.
12. Carry on an active pollution abatement program wherever contamination by domestic or industrial pollutants degrades quality of water or contaminates fish.

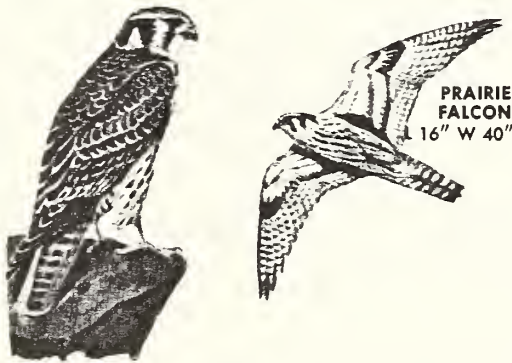
PRAIRIE FALCON

Falco mexicanus (Schlegel)

STATUS: Unique; of interest because of its broad distribution but limited numbers. Has disappeared from many localities within its overall range.

REGIONAL DISTRIBUTION: Uncommon, especially in summer but ranges through all National Forests in the Region. May be seen more frequently during the winter months or in migration. More likely to be found on the northern Forests in the summer and further south at other times of the year.

HABITAT TYPE ASSOCIATION: Found on high plains, open mountains, deserts, very wide ranging. Most falcons leave these habitat types in spring for suitable nesting places, preferably in rugged walled canyons or on cliffs over open country.



Prairie Falcon

Distribution is not shown because occurrences are too scattered and indefinite.

SOUTHWESTERN REGION
NATIONAL FORESTS AND GRASSLANDS

DISTINGUISHING CHARACTERISTICS: A medium sized, pointed winged, long tailed hawk. The general color above is a pale sandy brown, with a dark thin moustache mark in the malar area, not as distinct as that of the similar peregrine falcon. The underside is pale white with brown streaks. Distinguishing marks are the conspicuous dark colored patches where the base of the wing joins the body. They are best seen when the falcon is in flight.

REPRODUCTION: Nest sites are usually in recesses or potholes on ledges on sheer cliffs 30 or more feet above the ground. They frequently have a southern exposure, face open country and have a protective overhanging projection above. The eggs are laid directly on dust, sand or gravel, or whatever litter may be present with no nesting material whatsoever. There are usually 4 or 5 creamy-white or reddish eggs, heavily marked with brown, but they may vary widely in appearance. Eggs are laid in early spring with usually only one set per year. A second set may be laid if the first set is destroyed. Incubation period is thought to be about 28-31 days. Young remain in the nest for five weeks and are very shortly capable of caring for themselves.

FOOD HABITS: This species is known to catch and eat small birds and mammals. They have been observed to take game birds up to those equal to their own size and, on occasion, may steal barnyard fowl. They may also occasionally take lizards and insects. Food is usually taken in the air by making lightning-swift swoops which are very gracefully executed.

HAZARDS TO THE SPECIES: This falcon does not appear to have many natural enemies. Most losses may be due to human activity, largely resulting in build up of chemical poisons in the food chain, the negative effect of pesticides on production of young, and robbing of nests to provide young birds for falconry.

HABITAT REQUIREMENTS: This bird prefers open prairie or grassland areas near rugged foothills. Needs steep, inaccessible cliffs for nesting.

PROTECTIVE MEASURES ALREADY TAKEN: Protected by the Migratory Bird Treaty Act.

MANAGEMENT PROPOSALS:

1. Participate in interagency studies to gather additional biological data on habitat requirements, distribution, population levels and nesting sites.
2. Do not publicize known nesting sites and protect them from human disturbance.
3. Give management consideration in all Forest functional activities which may cause physical disturbance of falcons' preferred habitat. Particular emphasis should be given to protection of suitable nesting sites near open areas abounding in food species and to projects involving the use of pesticides.

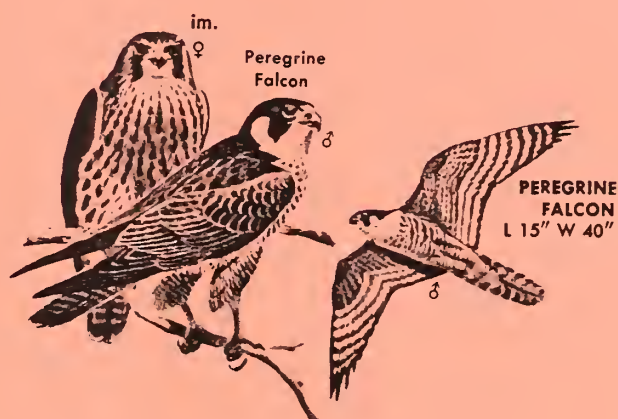
PEREGRINE FALCON; DUCK HAWK

Falco peregrinus anatum (Bonaparte)

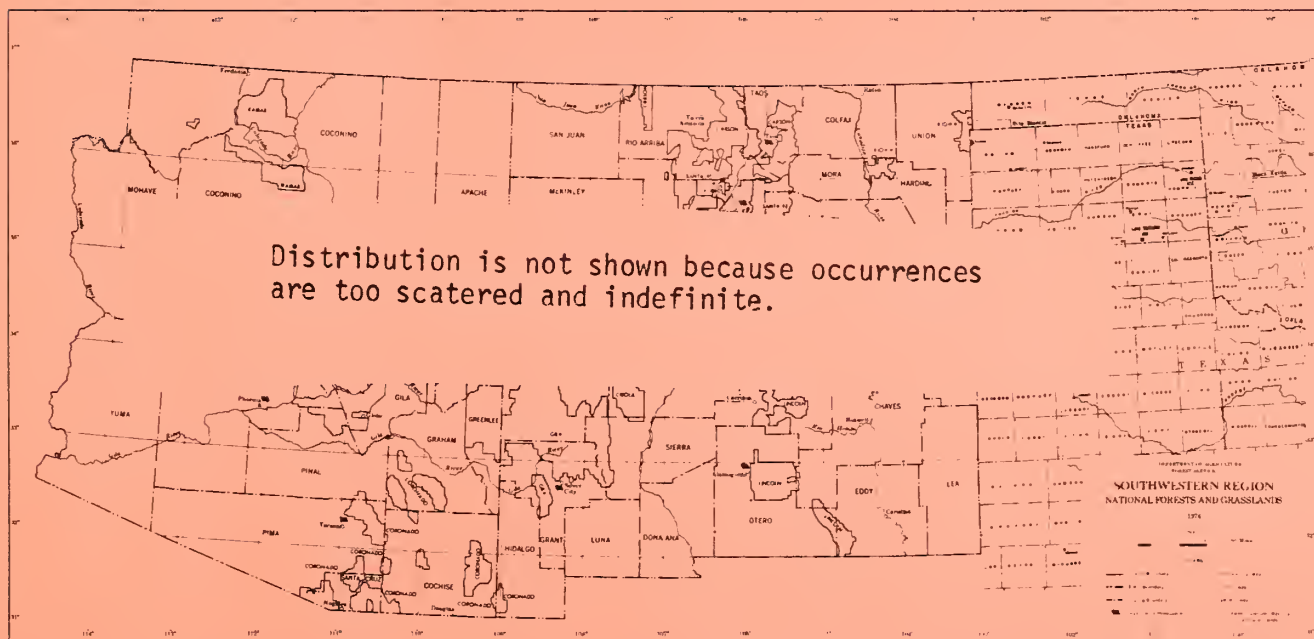
STATUS: Endangered; breeding or nesting birds are rare in Arizona and New Mexico. In 1969 only two active nests of this species were known in each State. (Group I, New Mexico)

REGIONAL DISTRIBUTION: The range of the Peregrine Falcon includes the entire Region.

HABITAT TYPE ASSOCIATION: This bird frequents open, brushy, grassy country near streams and lakes.



Distribution is not shown because occurrences are too scattered and indefinite.



DISTINGUISHING CHARACTERISTICS: A medium sized hawk with a long tail and long, pointed wings. Flies with a rapid, shallow wing beat. Adults are slate blue-gray above, with black bars on wings, flank and tail. Underparts are white shading into a reddish-buff spotted and barred with black. Throat is white with a distinctive black moustache mark on side of head and throat. Immature birds have a brown back, underparts streaked with brown, and the typical moustache mark.

REPRODUCTION: Nests are often scrapes in a pothole or other cavity in sandstone cliffs or high cut banks. These may be lined with grass and surrounded by a few twigs or flakes of rock. The average clutch is 3 or 4 eggs but may be as many as 6. Only one set is raised per year, but a second or even a third clutch may be laid if previous sets are lost. Eggs are creamy-white to pale pink blotched or spotted with red or brown. Early sources indicate a 28 day incubation period but later authorities say at least 33 to 35 days. Both parents take part in incubation, with the male participating more during the last half of the nesting period. The young leave the nest in 33 to 35 days. Full juvenile plumage develops during this period and is worn for a year or more. The molt to adult plumage is complete, but prolonged, and the time of molting may vary considerably.

HAZARDS TO THE SPECIES: There are few natural predators of this species though racoons and horned owls may eat eggs and young falcons. Two diseases known to occur in wild peregrines are botulism and tricomomiasis. Both are contracted from infected birds on which the falcons prey. The cumulative effects of pesticide residues ingested with the tissue of insect eating birds upon which the peregrine preys may either directly kill these falcons or prevent reproduction by rendering the eggs nonviable. Other hazards have been indiscriminate shooting of falcons and collecting of young and adult birds for falconry. Sonic booms may crack egg shells or disturb brooding adults. It is said that only about 15 percent of the fledged juvenile peregrines reach full maturity.

HABITAT REQUIREMENTS: The peregrine requires a combination of cliffs suitable for nesting readily accessible to open grassy or brushy hunting territory and reasonably close to water in the form of lakes or running streams. Rivers are the preferred water element of the habitat.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Protected under the Endangered Species Act of 1973, the New Mexico Wildlife Conservation Act of 1974 and State Law in Arizona.

2. The location of identified nest sites has been a closely guarded secret to prevent the exploitation of both eggs and falcons for monetary gain.

MANAGEMENT PROPOSALS:

1. Participate with state game and fish departments and research agencies in cooperative studies to determine biological data, distribution, population, habitat requirements and nesting sites.

2. Preserve any dead specimen which may come to hand and turn it over to the U. S. Fish & Wildlife Service for analysis of pesticidal content.

3. Give this species management consideration in all Forest functional activities to prevent physical disturbance of nesting sites.

4. Known nesting sites should be mapped and functional activities restricted from the immediate vicinity of the nest. Location of these nesting sites should not be publicized!

5. Forest timber management programs using herbicides and pesticides should not be conducted until interagency field surveys have ascertained that no adverse effects on this species will occur. Such planned programs should be eliminated from known nesting and preferred habitat areas.

6. Participate in on-going research on falcon propagation methods and, when techniques have been developed, in the reintroduction of peregrine falcons into unoccupied historic ranges.

NOTES

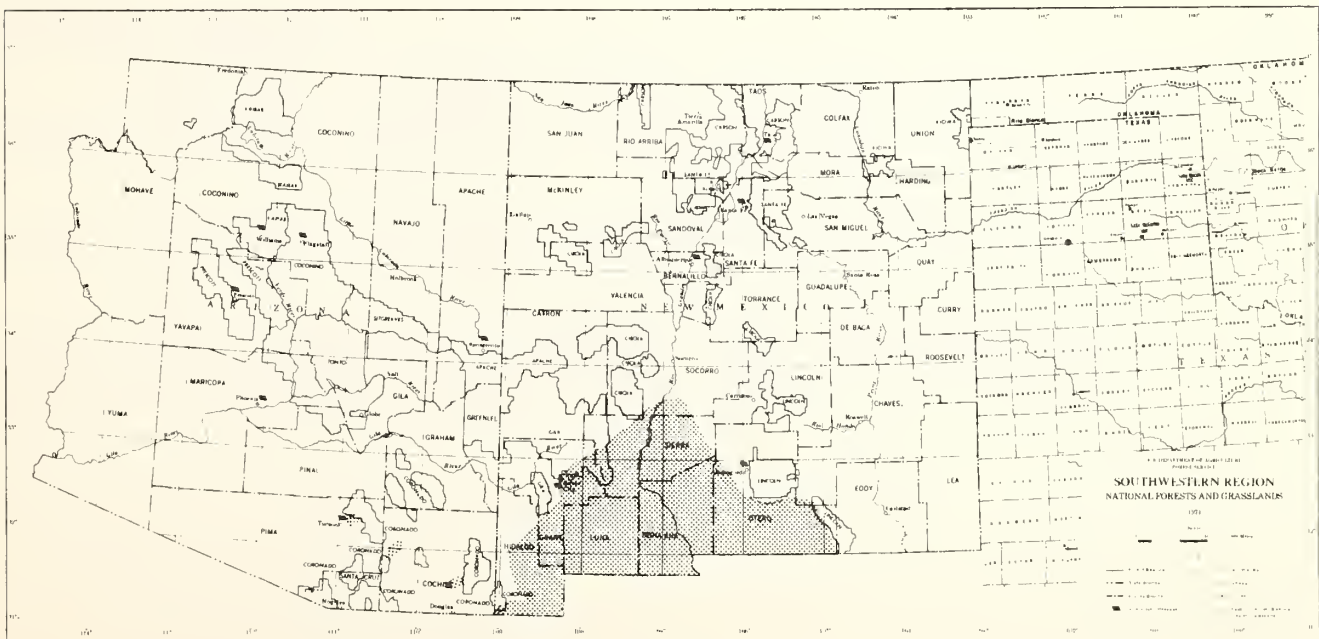
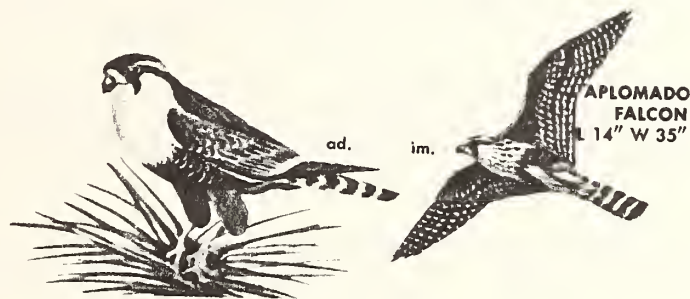
APLOMADO FALCON

Falco femoralis (Temminck)

STATUS: Unique; a very rare peripheral species which may now be completely extirpated from its previous range in the extreme southern part of the Region. (Group I, New Mexico)

REGIONAL DISTRIBUTION: Unknown; there have been no recorded sightings in Arizona and New Mexico over the past several years. This species may be a casual or accidental visitor to its former area of residence along the United States-Mexican border.

HABITAT TYPE ASSOCIATION: This bird is an inhabitant of the arid open prairies where there are clumps or "Forests" of yucca or mesquite and cactus. The Aplomada falcon habitually spends much time at rest, perching on dead yucca stalks.



DISTINGUISHING CHARACTERISTICS: A typical, medium size, falcon with long pointed wings and long narrow tail. In flight the contrasting black belly and white or buffy-cinnamon breast and the dark underside of the wings are good identifying marks. The conspicuous black flanks and belly, contrasted with the cinnamon flanks and breast and blue-gray upper parts make it easy to identify a perching adult. There is a white line on each side of the crown and a small black comma-like moustache mark on the side of the head and throat. Six or seven white bars on the tail complete the field marks. The juvenile plumage is similar in pattern but is browner in the dark areas and the breast is streaked.

REPRODUCTION: The nest of the Aplomado falcon consists of slightly depressed platform of twigs, lined with grass and placed in a fork near the top of a yucca. Most of the egg laying takes place in mid-April but may occur from the middle of March to the end of May. The average clutch consists of three eggs which are whitish covered with small brown spots. Little is known of the incubation, development and rearing of the young.

FOOD HABITS: Early investigators found the food of this species to consist of small reptiles, mice and other rodents, grasshoppers, and other insects of various kinds and an occasional bird.

HAZARDS TO THE SPECIES: There is no known data on this subject. It is suspected that the Aplomado falcon is subject to the same depredations and secondary destructive influences of pesticides as other members of the falcon family.

HABITAT REQUIREMENTS: The preferred habitat is open arid plains with a scattered growth of mesquite, yucca and cactus. Tall, forked yuccas provide the favored nesting and perching sites.

PROTECTIVE MEASURES ALREADY TAKEN: Protected by State law in New Mexico and Arizona.

MANAGEMENT PROPOSALS:

1. Participate in interagency studies of biological data such as life history information, distribution, population levels and nest locations and identification of various limiting or decimating factors.
2. Give species management consideration in all Forest functional activities to prevent encroachment and disturbance of nesting areas.
3. Forest range management programs using herbicides and pesticides should not be conducted until interagency field surveys have ascertained that no adverse effects on this species will occur. Such planned programs should be eliminated from preferred habitat areas.

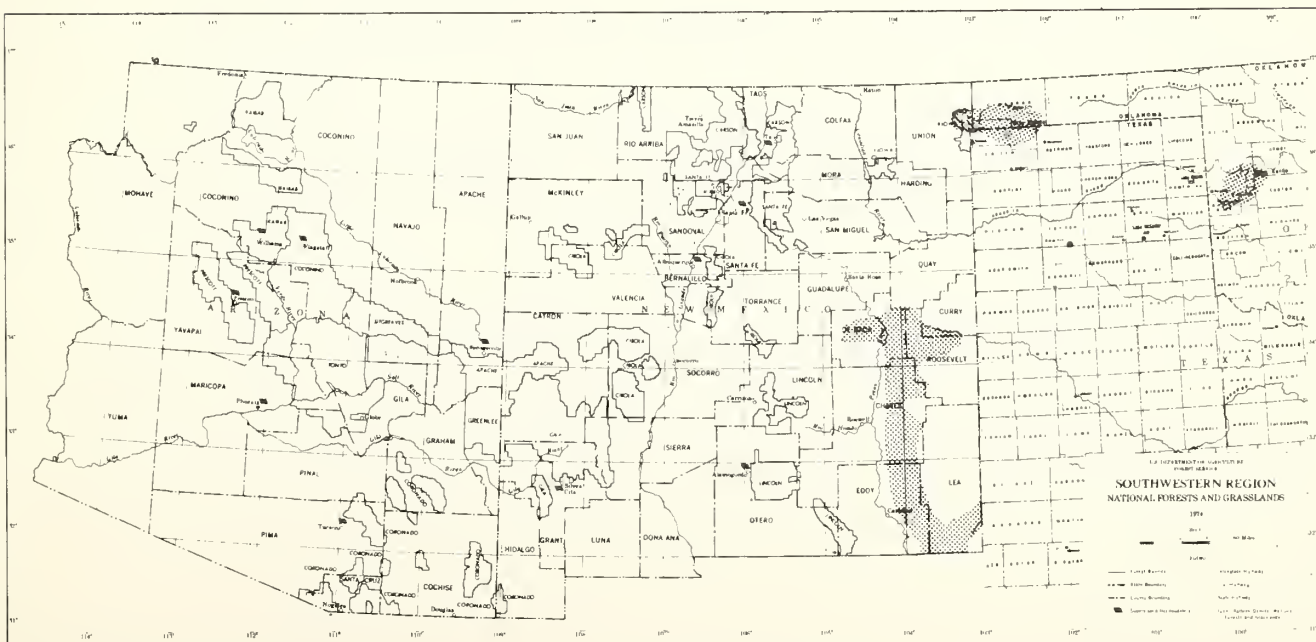
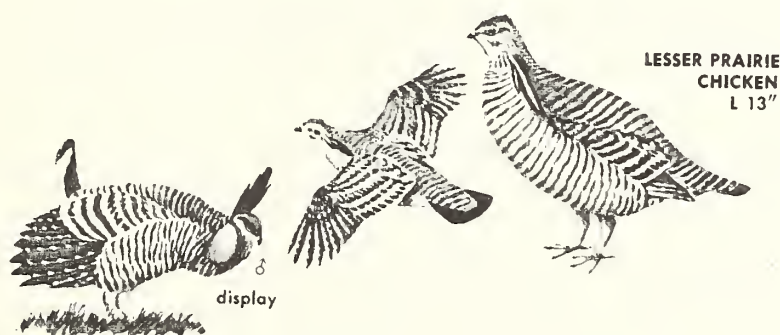
LESSER PRAIRIE CHICKEN

Tympanuchus pallidicinctus (Ridgway)

STATUS: Unique; of interest because of occurrence at southwestern limit of range and great annual fluctuation of population.

REGIONAL DISTRIBUTION: Cibola National Forest. The lesser prairie chicken is found in portions of the Rita Blanca and Black Kettle Districts; in Texas and Oklahoma. The largest and, at times, huntable population is found in western Oklahoma. Oklahoma has a hunting season during years when spring and fall inventories indicate an adequate population. A huntable population also exists in portions of eastern New Mexico.

HABITAT TYPE ASSOCIATION: Broad areas of grassland, interspersed with clumps of brush (sand sagebrush or shinnery oak) constitute the most suitable habitat.



DISTINGUISHING CHARACTERISTICS: General appearance of the lesser prairie chicken is similar in shape to a domestic chicken. The color is a light brown barred pattern intermixed with black on the back and white barred with dark brown or black below. Legs of the prairie chicken are feathered, and males have bare reddish gular sacs on the side of the throat which are inflated during the spring mating period when the typical booming activity takes place. The black bar across the tip of the tail is prominently displayed in flight.

REPRODUCTION: Mating season is variable in the spring depending upon the weather. The ritual booming dance of the males marks the onset of the breeding season. This usually occurs in late March or April. The nest is scooped out hollow in the sand, lined with grass. Eggs are laid in large clutches thought to average 11 to 13 per set. Eggs are pale ivory or creamy yellow, thickly but faintly spotted with very fine lavender spots, which may be nearly invisible. The chicks hatch in late May or early June and are precocial in their habits.

FOOD HABITS: During the summer months, the diet consists largely of grasshoppers. In fall and winter the species subsist almost entirely on seeds and grain such as kafir corn, maize, cane seed and other semiarid cereals that may be available.

HAZARDS TO THE SPECIES: It may be assumed that the prairie chicken, including nests, chicks and adult birds, are subject to the same type of predation as other ground dwelling gallinaceous birds. Being game birds, a certain number are taken each year through legal hunting. However, the real hazard to this species is the loss of suitable habitat due to agricultural clearing. Brush control programs are removing woody vegetation (sand sagebrush, Artemisia filifolia, and shinnery oak, Quercus harvardi) which are required components of the lesser prairie chickens' habitat.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Cooperative State and Federal studies to learn life history requirements of the species.
2. Acquisition, by the State of New Mexico, of 23,000 acres of prairie land managed to benefit the prairie chicken through controlled grazing, supplemental planting, and limited hunting.

MANAGEMENT PROPOSALS:

1. Initiate and participate in cooperative studies with State and Federal agencies to learn additional life history information and maintain data on population levels, habitat availability, and distribution.
2. Manage grasslands to preserve large blocks of brushy grasslands where the species occurs and acquire additional land of this character when possible.

3. On areas where the species is present, management direction should proceed to benefit this species.

a. Suitable acreages of sagebrush or shinnery oak should be managed as an essential requirement for shade, shelter, and food for the species.

b. Establish or supplement food patches by seeding desirable species such as blue grama, sand dropseed and silver bluestem in sand sagebrush areas and little bluestem, switch grass, and Indian grass in shinnery oak areas.

c. Discourage annual burning of rangeland.

4. Participate with State and Federal agencies in projects to reestablish populations on suitable areas and initiate management programs.

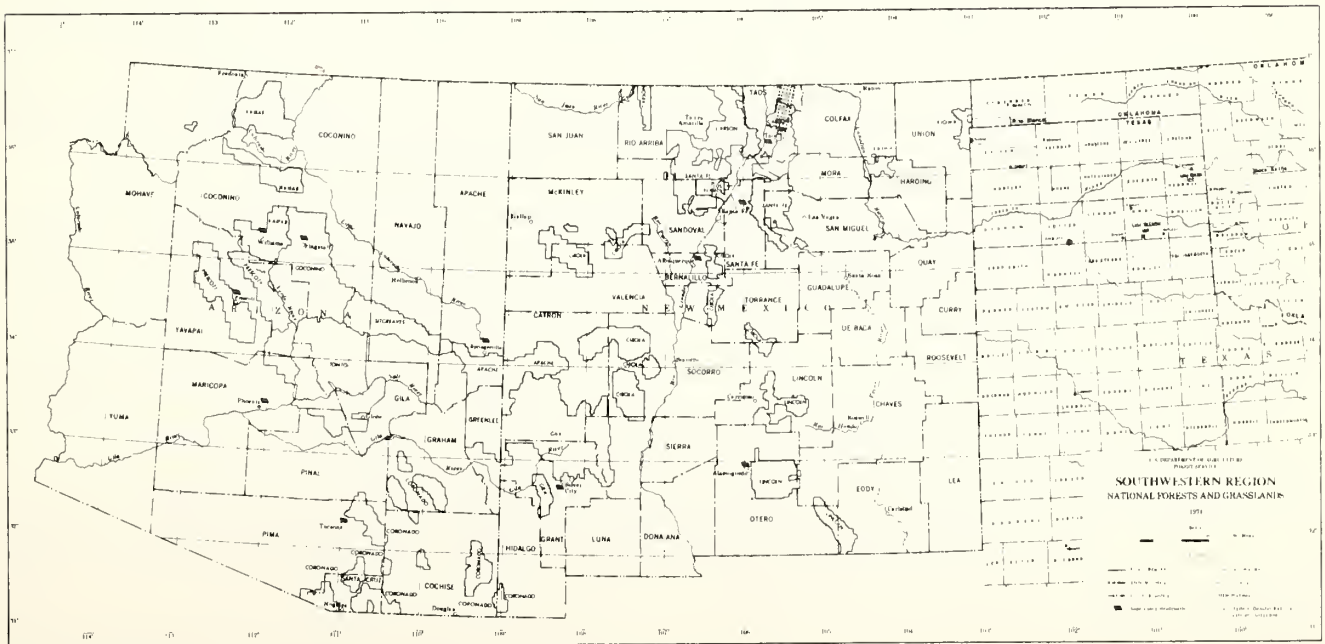
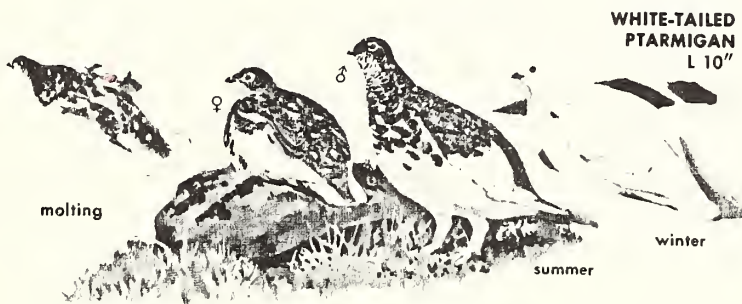
NOTES

SOUTHERN WHITE-TAILED PTARMIGAN

Lagopus leucurus altipetens (Osgood)

STATUS: Unique; of interest because it is the only ptarmigan found in the Western United States and is at the southern limit of its range in the Sangre de Cristo Mountains of New Mexico. (Group I, New Mexico)

REGIONAL DISTRIBUTION: Carson and Santa Fe National Forests. Formerly occurred in the Sangre de Cristo Mountains from Santa Fe, New Mexico, northward into Colorado. Believed to be extinct on Pecos, Baldy and the Truchas Peaks area on the Santa Fe National Forest. Ptarmigan are believed to still inhabit the area from Wheeler Peak on the Carson National Forest, northward to the Colorado border.



HABITAT TYPE ASSOCIATION: This species inhabits the wind-swept tundra atop the alpine summits of the highest mountains. Its home during most of the year is above timber line at the 10,000 to 13,000 foot level. Alpine Krummholz areas, primarily willow, are preferred habitat. Past domestic sheep grazing has removed much of the willow formerly present in historical ptarmigan habitat in New Mexico and may have been instrumental in population decline.

DISTINGUISHING CHARACTERISTICS: The ptarmigan represents the ultimate in protective coloration. During winter the plumage is pure white; only the eyes and bill are black. This changes as the seasons advance and by mid-summer, the back, throat, and breast become a light brown color, heavily marked with wavy black bars and spots. The wings and tail remain white at all seasons. This coloration blends in perfectly with the rocks and dried vegetation where the ptarmigan lives so that birds which remain quiet are almost impossible to pick out. The legs and feet of the ptarmigan are feathered to the toes.

REPRODUCTION: The nest is a very simple structure, not much more than a simple depression made in short grass amid loose rock debris. The setting hen is well camouflaged among the boulders where the nest is located is very difficult to flush when incubating. The eggs are buff-colored, spotted or blotched with brown, and may number 15 or 16 in a clutch although the average is 10 or less. The young are precocial and leave the nest nearly, as soon as they are dry after hatching. Like young chickens, they are watched and brooded by the hen until capable of caring for themselves. Nesting is thought to take place around the first to middle of June with young hatching during the first half of July.

FOOD HABITS: Living largely on snow free areas, ptarmigan subsist largely on vegetable matter. Buds of dwarfwillow make up a substantial portion of the winter diet. This is expanded during the growing season with smartweed seeds, berries and blossoms of leguminous flowers, marsh marigold and buds and catkins of dwarf birch. At times, this may be supplemented with small insects including grasshoppers.

HAZARDS TO THE SPECIES: Not too much is known of predator relations with this species. Habitat destruction as a result of overgrazing, primarily by domestic sheep, is the most limiting factor to the species.

HABITAT REQUIREMENTS: Being a species, adapted to life in the alpine life zone, the ptarmigan is dependent upon the vegetation of high mountain tundra. The sparse vegetation of this area must be maintained if this rare species is to continue to exist in the Region.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Protected by the New Mexico Wildlife Conservation Act of 1974.
2. Discontinuance of grazing by domestic sheep on the Carson and Santa Fe National Forests in areas historically inhabited by ptarmigan.

MANAGEMENT PROPOSALS:

1. Initiate and participate in biological data collection studies with New Mexico Game and Fish Department, state universities, Audubon societies and interested individuals to gather additional information on sight observation, population levels, distribution, habitat availability and other pertinent habitat management data.

2. Continue to restrict range use of alpine meadows and slopes to preserve existing habitat.

3. Consider seeding programs to restore past habitat which has been degraded.

4. Cooperate with the New Mexico Department of Game and Fish to consider programs to reestablish this species within its former range.

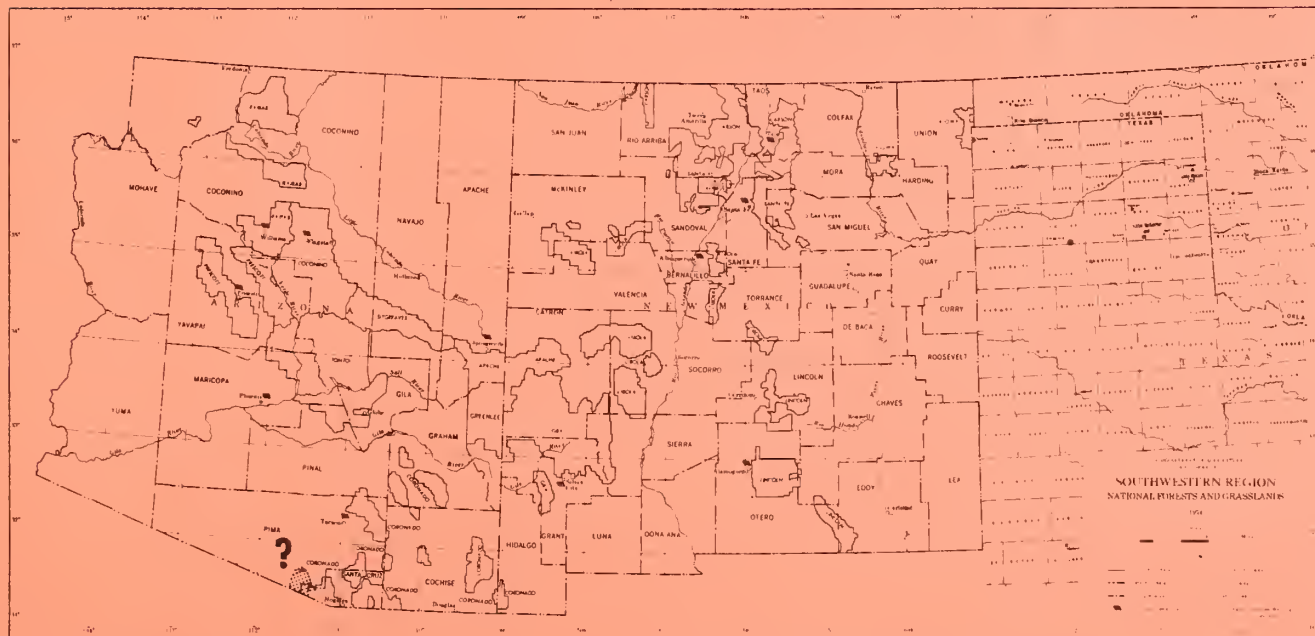
NOTES

MASKED BOBWHITE QUAIL

Colinus virginianus ridgwayi (brewster)

STATUS: Endangered; native birds have been extirpated for many years from southeastern Arizona. Attempts are now being made to reintroduce the species to its former range.

REGIONAL DISTRIBUTION: Coronado National Forest; several unsuccessful attempts have been made in the past to reintroduce this quail in southeastern Arizona and southwestern New Mexico; limited localized populations still exist to the south in the State of Sonora, Mexico.



PROTECTIVE MEASURES ALREADY TAKEN:

1. Protected by the Endangered Species Act of 1973.
2. Propagation of the species by the U. S. Fish and Wildlife Service. The original stock came from live trapped birds captured in Mexico.
3. Release of pen reared birds which resulted from the propagation program into sites in Altar Valley in south central Arizona (BLM and Forest Service lands). An additional 147 birds were released on the Canoa allotment, Nogales Ranger District, on the Coronado National Forest in April 1973.

MANAGEMENT PROPOSALS:

1. Continue to cooperate with the Arizona Game and Fish Department, U. S. Fish and Wildlife Service and BLM to reintroduce quail to suitable habitat.
2. Following introduction of birds to suitable habitat on National Forest System land, reserve these areas for quail management and restrict other functional activities to insure successful reestablishment of this species.
3. Continue interagency field surveys to determine if native populations are in existence in remote areas and gather data on preferred habitat for future reintroductions and management.

NOTES

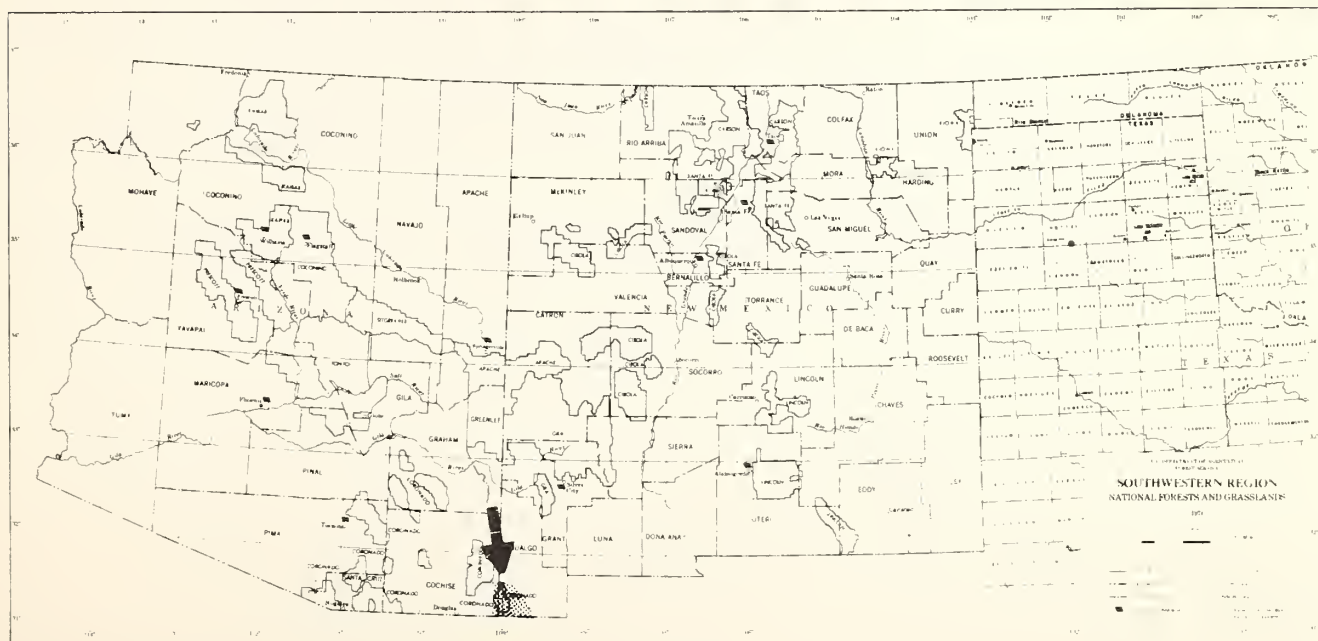
GOULDS TURKEY

Meleagris gallopavo mexicana (Gould)STATUS: Unique, of interest as a peripheral species. (Group II, New Mexico)

REGIONAL DISTRIBUTION: Questionable on the Coronado National Forest. Formerly found in southeastern Arizona and the Peloncillo Mountains of southwestern New Mexico. May cross the international boundary from the Sierra Madres in periods of favorable weather which improve the availability of water, food, and ground cover in the Southwestern U. S.

Gould's turkey - white
tipped tail.

Merriam's turkey - tan
tipped tail.



HABITAT TYPE ASSOCIATION: The species prefers oak woodland compound predominantly of gray oak, Arizona white oak and Chihuahua pine, with a heavy understory of madrone. Overmature pines with thick, unobstructed limbs serve as roost trees and are usually the tallest and largest trees in the area.

DISTINGUISHING CHARACTERISTICS: This is the largest of all known races of turkeys. It is very similar in appearance to Merriam's turkey but differs in having pure white tips on the tail feathers rather than buffy tan.

LIFE HISTORY DATA: This is primarily a species indigenous to Mexico, and we have very little biological data available.

REPRODUCTION: Unknown but thought to be very similar to that of Merriam's turkey. Nests are usually a leaf-lined depression on the ground in woods, thickets, or in the open under fallen tree tops.

FOOD HABITS: No studies are available concerning the food habits of this species. The preferred habitat of this turkey would dictate considerable use of oak mast during the fall and winter. This is probably supplemented by mast from other trees and shrubs such as juniper, pine, madrone, wild cherry, manzanita, and black berry. At times they may vary their diet with insects, tender green leaves, plant bulbs and grass seed. They are basically ground feeding birds.

HAZARDS TO THE SPECIES: Unknown

PROTECTIVE MEASURES ALREADY TAKEN: Protected by the New Mexico Wildlife Conservation Act of 1974.

MANAGEMENT PROPOSALS:

1. Initiate and participate in studies with the State game and fish departments to gather life history data, including population levels, distribution, habitat availability, and nest sites.
2. Give the species management consideration in all functional activities which could cause physical disturbance of habitat, particularly brush removal and commercial timber harvest.
3. Consider brush thinning projects on overmature or decadent stands of mast producing species to stimulate regeneration and mast production.

NOTES

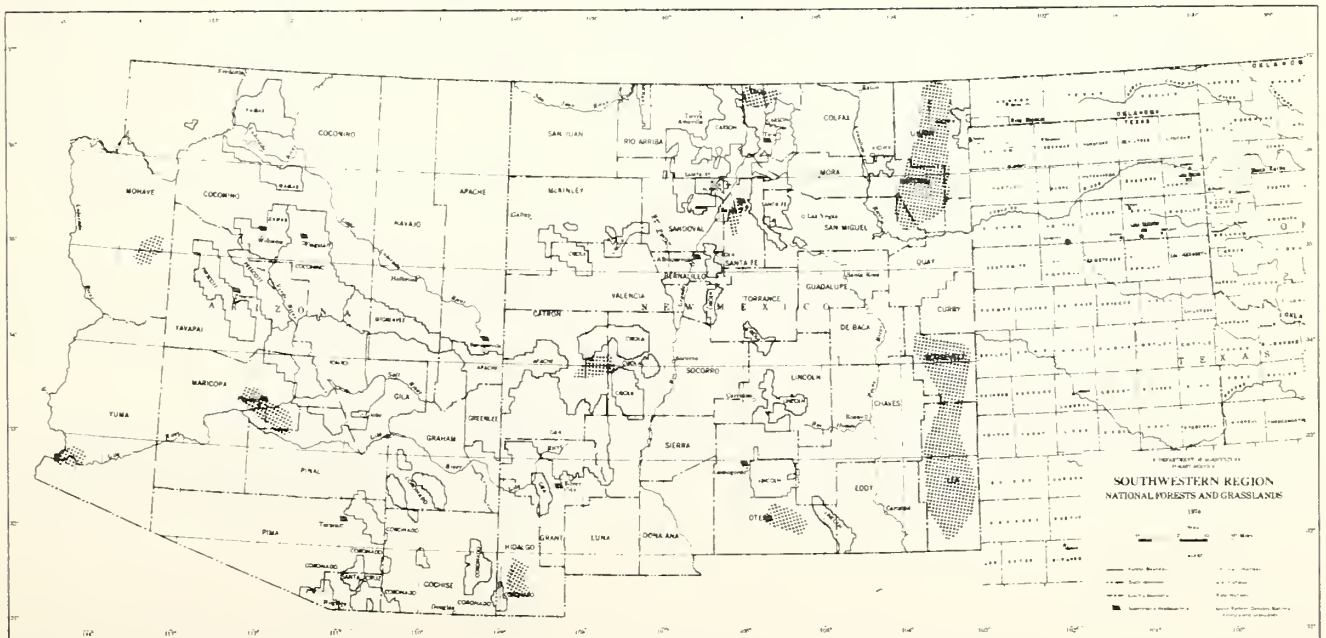
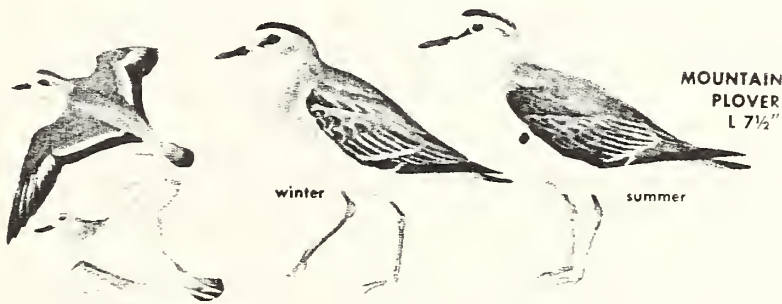
MOUNTAIN PLOVER

Cnradrius montanus (Townsend)

STATUS: Unique; of interest because of uncertain status and population trend.

REGIONAL DISTRIBUTION: Cibola, Carson, Lincoln, and Santa Fe National Forests. Occurrence is locally rare to common throughout the Region. The most extensive breeding range in this Region is east of the Pecos River and south of the Sacramento Mountains, although some breeding birds are rare fall and winter visitors to western and southern Arizona.

HABITAT TYPE ASSOCIATION: The plover's breeding range includes arid plains and grassy mesa country up to 7,000 feet elevation. This bird is never seen in the high mountains so its name is misleading.



DISTINGUISHING CHARACTERISTICS: Plover's blend into their environment so easily that they are difficult to observe. Even ground movements tend to conceal them since they run rapidly for short distances, then stand motionless. They are similar in shape and general color to the killdeer, but are smaller, lighter colored, and do not have the black bands across the neck or breast. The back is a buffy brown and the under parts are nearly white. In breeding plumage they have a white forehead and line over the eye and a black patch on the crown. In winter the distinctive head markings are absent.

REPRODUCTION: Although ornithologists group and classify mountain plovers with the shore birds, water is not a nesting requirement. The nest is usually just a scrape in bare ground between two small hummocks of grass with no protection or concealment. Eggs are laid on bare ground in a slight indentation so they do not roll, but may have grasses or roots around them. The clutch consists of 2 to 4 eggs, usually 3, olive or buff in color and having dark spots on the large end. More information is needed on incubation and rearing of the young birds.

FOOD HABITS: The mountain plover is insectivorous, with grasshoppers constituting the major portion of the diet. Other insects such as crickets, beetles and flies are also taken.

HAZARDS TO THE SPECIES: Little is known of predation or natural enemies of this species. Probably the greatest hazard is destruction of the habitat, but more study is needed to determine the accuracy of this assumption.

HABITAT REQUIREMENTS: The most commonly used habitats are the grassy mesas, and semi-arid grasslands and plains. At times nesting occurs in sandy desert areas, and wintering birds have been found on fallow fields and barren desert flats. As stated above these are not birds of the high mountains, nor are they shore birds, as their name and classification would imply. During the non-breeding season they tend to flock together in the low, open desert country behaving much like the more common and more easily recognized horned larks.

PROTECTIVE MEASURES ALREADY TAKEN: Protected by the Migratory Bird Treaty Act.

MANAGEMENT PROPOSALS:

1. Initiate and participate in studies with state game and fish departments, universities, Audubon societies and interested individuals to determine or extend knowledge of life history including sight observations, nesting locations, incubation and rearing of young, population levels and distribution.

2. Give species management consideration in all Forest functional activities to insure proper management of nesting habitat, and protection from direct and secondary poisoning resulting from use of chemical pest control and noxious plant control.

3. Consider establishing mountain plover management areas in the primary breeding range of this species.

4. Initiate and conduct or contract studies on the effects of grazing on mountain plover habitat.

NOTES

DISTINGUISHING CHARACTERISTICS: This is a large, dark brown owl marked with numerous white spots. It has a round head with no "horns" or ear-tuffs, and is the only western owl with large dark eyes. White fecal droppings under fir trees or in caves may be clues to the presence of these owls. The species is a very tame and mild dispositioned owl, and is even considered stupid by some students. It will not take aggressive action, even in defense of its young. Nocturnal in habit, the species seldom moves during the day until disturbed.

REPRODUCTION: The nest may be in a hole or crevice in a cliff or bluff or in a cavity or the branches of a large tree. On occasion they have been known to utilize abandoned nests of other birds such as ravens and Cooper's hawks. Eggs have been found laid in depressions on bare ground in a cave, and in nests of twigs and sticks lined with bark, twigs and feathers. Eggs are white, usually 2 or 3 in number, and are most frequently laid during the middle part of April. Very little is known about the growth and development of the young.

FOOD HABITS: These are considered to be highly beneficial birds, which feed primarily on various species of rats and mice. They may also take chipmunks, other small rodents, and a few birds, and even insects at times.

HAZARDS TO THE SPECIES: Little is known in regard to predators of this species. Human disturbance of their habitat probably is responsible for decreasing presence of Spotted Owls.

HABITAT REQUIREMENTS: The Spotted Owl tends to be a bird that require or at least prefers considerable solitude. Preliminary studies indicate that they require from one-half to one section of undisturbed, dense old-growth coniferous timber. Dense, heavily-wooded, canyons, with flowing streams, and montane canyon-riparian vegetation seem to be essential. Mixed conifer with occasional large snags and accessibility to cliffs or bluffs contribute to the desirable attributes of spotted owl habitat.

PROTECTIVE MEASURES ALREADY TAKEN: Protected by the Migratory Bird Treaty Act.

MANAGEMENT PROPOSALS:

1. Initiate studies of the life history and biological data of this species with particular emphasis on habitat requirements.
2. Give special emphasis to consideration of the needs of this species in all Forest functional activities and project proposals to prevent encroachment on, or disturbance of known areas of spotted owl habitat.
3. Include a specific statement in regard to spotted owl habitat in all environmental analysis, and environmental statements.
4. Insert specific clauses protecting spotted owl habitat in all timber sale and road contracts when logging or road construction may result in destruction of existing spotted owl habitat.

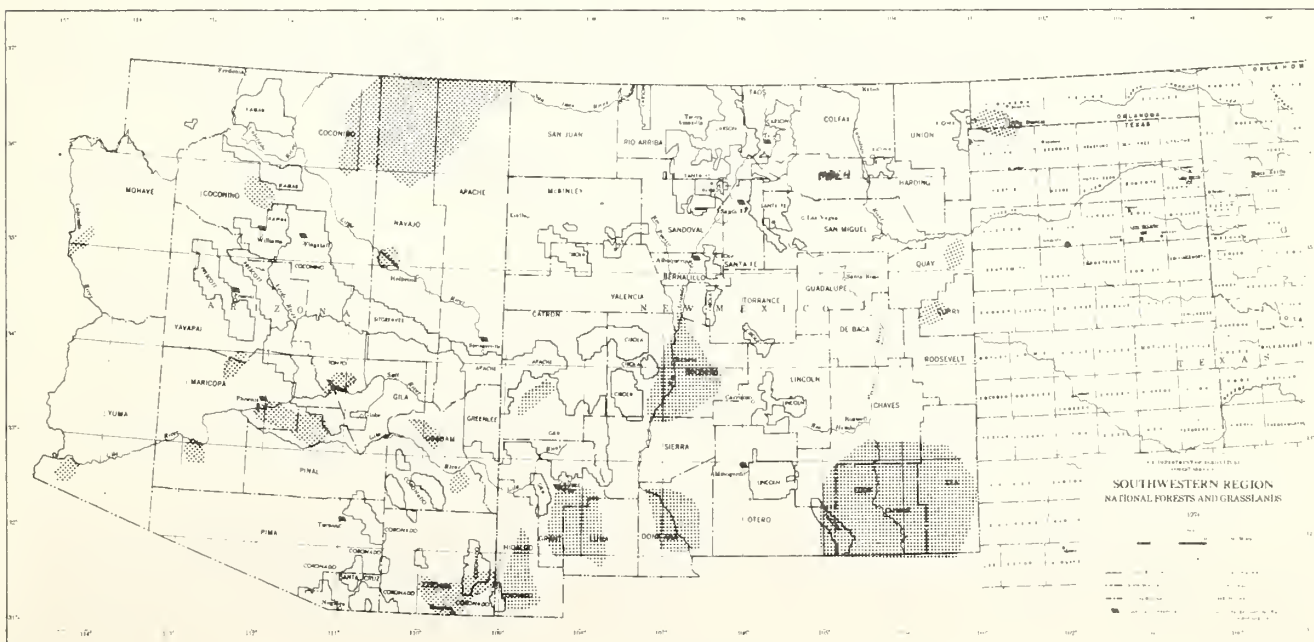
BURROWING OWL

Speotyto cunicularia (Molina)

STATUS: Unique; species presence is related to availability of prairie dog or other animal burrows. Population trend may be decreasing.

REGIONAL DISTRIBUTION: This owl may be found generally throughout the Region, where suitable habitat exists.

HABITAT TYPE ASSOCIATION: Flat, open prairie type country generally away from cultivated farm lands.



DISTINGUISHING CHARACTERISTICS: This is a small, brown, roundheaded owl with long legs and a short tail, frequently seen in daytime sitting on fence posts or the mound at the entrance to its burrow. Has a habit of bowing or bobbing when annoyed.

REPRODUCTION: This owl nests in animal burrows, usually prairie dog, but may be the enlarged burrow formally occupied by ground squirrels, kangaroo rats or other burrowing mammals. Nest is usually at the end of the burrow and lined with flakes of horse or cow dung, which may also provide conspicuous evidence of an owl nest at the mouth of the burrow. The average number of eggs is 8 or 9 which are pure white when cleaned, but when found are heavily spotted with excrement of fleas which abound in the nests. Both parents take part in the incubation which lasts about 21 days. Only one brood is produced per season. If the first set is destroyed a smaller second set is often laid. Breeding occurs from March to July. Eggs are most frequently laid during the middle of April. Young birds are fully fledged and have their first adult plumage in September. Because of cannibalism and predation on young owl chicks successful hatching amounts to only 1.7 to 2.2 young per breeding adult.

FOOD HABITS: The burrowing owl is one of our most beneficial birds of prey, subsisting largely on insects and injurious rodents. These include grasshoppers, locust, crickets of several kinds, beetles, caterpillars, dragon flies, ground squirrels, pocket mice, deer mice, house mice, and gophers. Some small birds are taken, especially when owls are rearing their young, as well as tree frogs and toads. These owls will consume quantities of insects equivalent to their body weight in a twenty-four hour period, if they can get them.

HAZARDS TO THE SPECIES: Burrowing owls are not known to have many natural enemies. As mentioned above, some owlets are lost to cannibalism, gopher snakes, skunks, house cats and badgers. Highways are favorite feeding grounds, and as a result these owls fall victim to motor vehicles. They may also be destroyed as a result of efforts to poison or gas gophers and ground squirrels.

HABITAT REQUIREMENTS: These owls prefer the dry, level, open grassland of the prairie or the desert floor. Presence of burrowing rodents to provide nesting sites is a requirement of preferred habitat.

PROTECTIVE MEASURES ALREADY TAKEN: Protected by the Migratory Bird Treaty Act.

MANAGEMENT PROPOSALS:

1. Initiate biological studies in cooperation with State Game and Fish Departments, universities, and/or Audubon and Ornithological Societies.
2. Give species management consideration in all Forest functional activities to prevent encroachment and disturbance of nesting areas.
3. Forest range management programs using herbicides or pesticides should not be conducted until interagency field surveys have ascertained that no adverse effects on this species will occur. Such planned programs should be eliminated from preferred habitat areas.

COPPERY-TAILED TROGON

Trogon elegans (Gould)

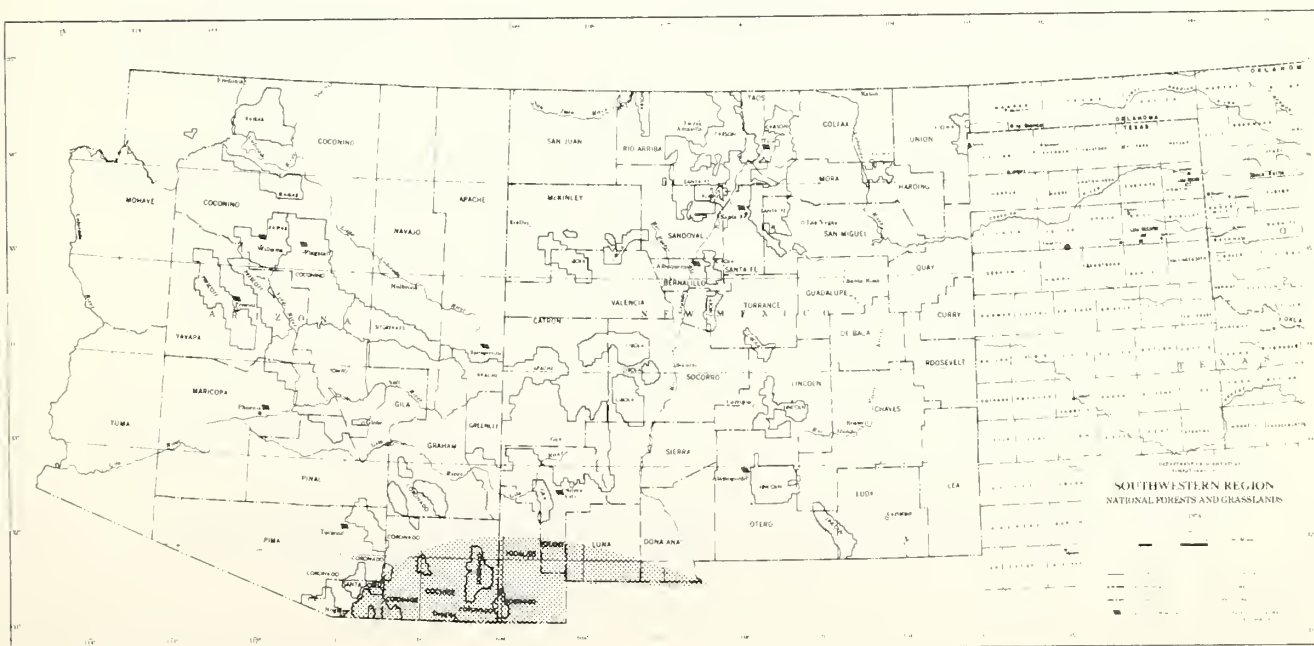
STATUS: Unique; of interest as a rare, peripheral species with considerable attraction for birdwatchers and ornithologists from all over the country.
(Group I, New Mexico)

REGIONAL DISTRIBUTION: Coronado National Forest. This exotic, brightly colored bird is found mainly in the forests of tropical America, but occurs here at the northern limit of its range. This trogon is an uncommon summer resident of the Santa Rita, Chiricahua and Huachuca Mountains of southeastern Arizona. There is a single record of a sighting in Guadalupe Canyon in the Peloncillo Mountains of Southwestern New Mexico. These birds are known to nest in Cave Creek Canyon in the Chiricahua Mountains and in Madera Canyon in the Santa Rita Mountains.

HABITAT TYPE ASSOCIATION: This is a bird of the thickly-wooded canyon bottoms, of the transition zone where sycamore trees occur in mixture with evergreen oaks, ponderosa and Chihuahua pine.



COPPERY-
TAILED
TROGON
L 10"



DISTINGUISHING CHARACTERISTICS: This brightly colored, jay-sized bird is readily recognized by its parrot-like shape, erect posture, and bright red belly. The male has a green head, chest and back of varying hues, with a white band separating the green of the breast from the red of the belly. The thick, parrot-like beak and a narrow ring around the eye are bright yellow-orange. The topside of the tail is indeed copper toned, but may be difficult to see. The underside is white with three pairs of spots separated by fine wavy black lines. The tip is crossed by a black bar. The female has a brown head, breast, and back, with a white band across the breast and a paler rose red belly. She has a distinctive white spot on her cheek behind the eye.

REPRODUCTION: The favorite nesting site of these trogons seems to be natural cavities or woodpecker holes in large, dead sycamore trees. However, they have also been known to nest in similar situations in Oak and Chihuahua pine and on occasion in holes in banks. Usually three or four dull white or pale bluish-white eggs are laid in the nest cavity. Further study is needed on the methods and length of incubation, length of time before the young leave the nest, and details on rearing.

FOOD HABITS: Trogons are primarily eaters of fruit and large insects. Both wild and orchard fruit are eaten when available. Grasshoppers, butterflies, moths, beetles, and larvae of various insects are eaten while feeding at middle elevation levels among the broad-leaved deciduous trees.

HAZARDS TO THE SPECIES: Little is known of the hazards to the species. They are considered to be quite shy and retiring, and nesting efforts may be abandoned if excessive human disturbance is permitted, especially during the early part of the nesting and mating period.

HABITAT REQUIREMENTS: The principal habitat for this species appears to consist of a narrow riparian belt in the bottom of mountain canyons. The type composition consists largely of Arizona sycamore, walnut, evergreen oaks, juniper, ash and chokecherry. At the upper elevational level chihuahua and ponderosa pine also occur. It appears that the availability of water is an essential element of the overall habitat requirements. These birds have not been observed in canyons which have the described vegetative composition but are lacking in permanent water.

PROTECTIVE MEASURES ALREADY TAKEN:

1. A special Trogon Habitat Study Plan for the Coronado National Forest has been prepared. This plan provides for the following protective measures:
 - a. Controlling road and trail construction, to avoid known trogon use areas.
 - b. Special fire prevention and suppression efforts to preserve critical trogon nesting habitat,
 - c. Studying effects of grazing on trogon habitat (and adjustment in management of grazing commensurate with findings of the study),

- d. Restricting issuance of special land use permits for activities which cause undue disturbance of these birds,
 - e. Providing special trails to enhance observation of trogons by interested parties in selected areas,
 - f. Recording and cataloging sightings of all bird species,
 - g. Discouraging dispersed camping and picnicking in areas known to be favored by trogons,
 - h. Restricting expansion of existing camping and recreation facilities into sites needed or favored by trogons.
2. Collector's permits are not issued for this species in New Mexico.

MANAGEMENT PROPOSALS:

- 1. Implement the recommendations of the Habitat Management Study.
- 2. Continue to study and to participate in studies with other interested State and Federal agencies and private organizations and individuals to gather more life history data on the species, and maintain current records of observations, distribution, and population levels.
- 3. Continue to give species management consideration in all Forest functional activities to protect and preserve existing habitat from degradation or elimination. This includes maintenance of stream water quality and quantity.
- 4. Maintain dead and partially dead trees, especially Arizona sycamore, suitable for trogon nesting habitat.
- 5. Regulate human use of canyons where trogons occur during the mating and nesting season (mid-May to August) to prevent excessive disturbance of nesting birds.
- 6. Limit or prohibit the use of tape recordings to call birds during the early part of the mating season.

NOTES

ROSE-THROATED BECARD

Platypsaris aglaiae (Lafresnaye)

The name is pronounced to rhyme with checkered!

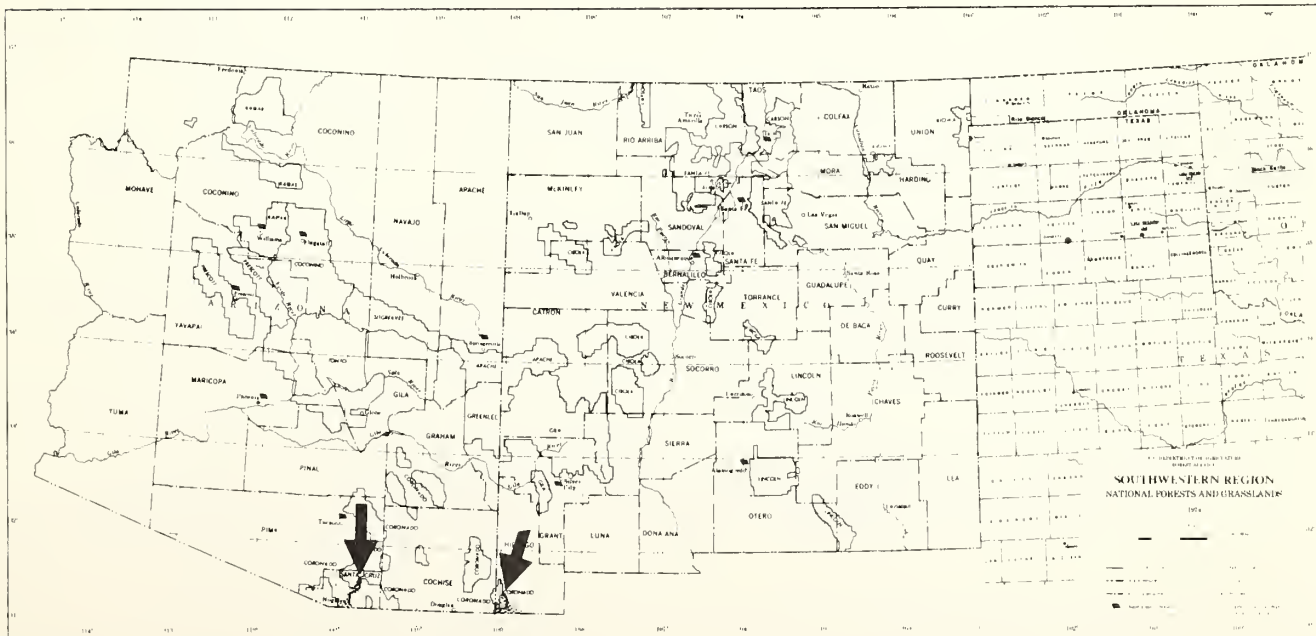
STATUS: Unique; of interest as a rare, peripheral visitor to the United States.

REGIONAL DISTRIBUTION: Coronado National Forest. Found as a local and irregular summer resident along Sonoita Creek near Patagonia and in Guadalupe Canyon in the Peloncillo Mountains of southwest New Mexico. This is the northernmost limit of its range. Abundant populations of this tropical bird exist in Central America.



HABITAT TYPE ASSOCIATION: In this country the becard frequents wooded stream canyons with much riparian vegetation, especially sycamore and cottonwood trees.

DISTINGUISHING CHARACTERISTICS: This bird has the general shape, appearance and behavior of the flycatcher, to which it is closely allied. The male has an unmarked gray back and wings, dark, blackish cap, light nearly white underparts and a rosy pink throat. The female is more brown than gray, with a darker cap, and buffy tan throat, collar and underparts.



REPRODUCTION: The nest of the becard is it's trademark. It is a unique, very large, pear-shaped structure, sometimes as much as 2 feet long and 3 feet in circumference at the widest point suspended from the tip of a sycamore branch from 20 to 60 feet above the ground. It consists largely of strips of inner-bark from cottonwood trees interwoven with grass, leaves, rootlets, and other vegetative material. The actual nesting cavity is only about as large as two closed fists, and the entrance is usually below the center. The eggs are white speckled with brown and the usual clutch size is five or six. Only the female incubates the eggs and broods the young birds, but both parents participate in feeding the nestlings. Little is known of the incubation period, but there is some indication that the young birds leave the nest at about 3 weeks of age.

FOOD HABITS: The food of becards is said to consist of berry seeds, fruit pulp, and insects, both adult and larvae. Insects are caught on the wing in a manner very similar to that used by the flycatchers.

HAZARDS TO THE SPECIES: There is no good information available, but excessive human activity and loss of suitable habitat are hazards to the species.

HABITAT REQUIREMENTS: Some authors indicate the habitat of becards as being quite variable utilizing tall trees in hot, arid areas and in other parts of the range cool, broad-leaved forests and rain forests. In Arizona the rose-throated becard has been found only in riparian situations, usually near Arizona sycamore trees, and never very far from running water. In only one instance in Arizona has a nest been found in a tree other than a sycamore; this was in a cottonwood.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Protected by State Law in Arizona and New Mexico
2. Protection of active nest sites
3. Preservation and protection of riparian vegetation in certain canyon areas.
4. Collectors permits are not issued for this species.

MANAGEMENT PROPOSALS:

1. Continue to initiate and participate in studies in cooperation with State Game and Fish Departments and universities and with interested private groups and individuals to gather additional life history data.

This should include sight records; nest locations, incubation and rearing of young; habitat; distribution; and population levels.

2. Continue to give species management consideration in all Forest functional activities, to preserve and protect existing riparian habitat from degradation or elimination. This includes maintenance of stream water quality and quantity.

3. As soon as sufficient data can be collected, develop and implement a habitat management plan for the rose-throated becard similar to the one prepared for the coppery-tailed trogon.

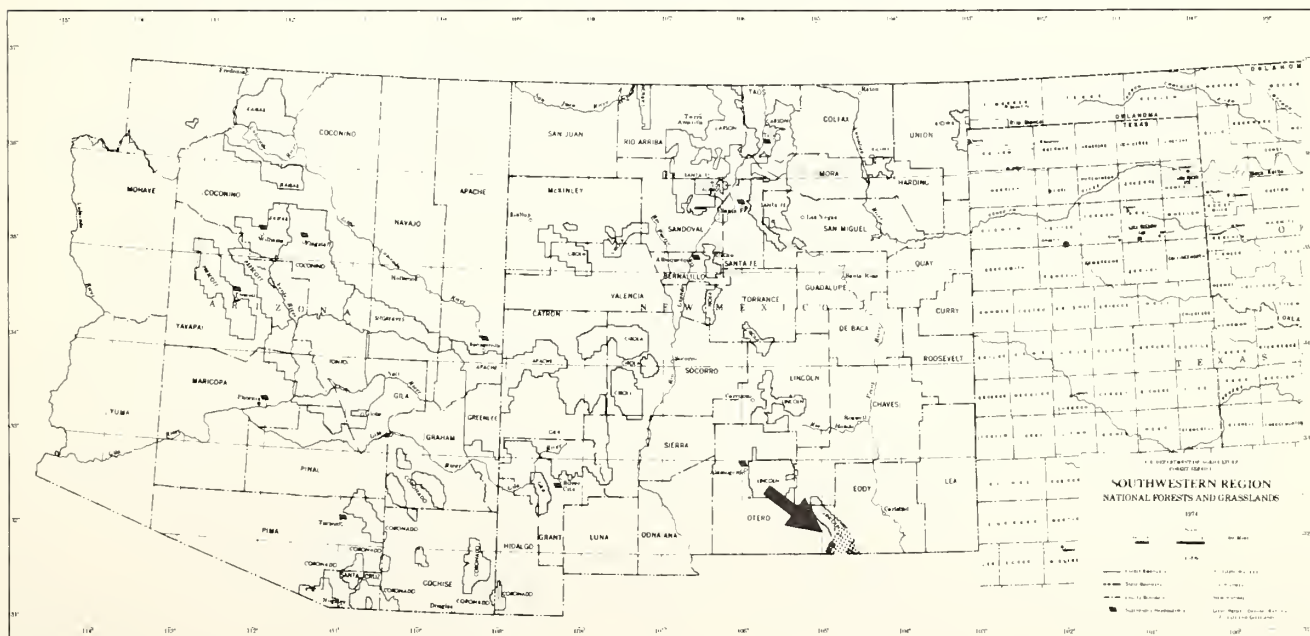
CAVE SWALLOW

Petrochelidon fulva (Vieillot)

STATUS: Unique; of special interest as a rare, peripheral species with a very limited breeding range in the United States.

REGIONAL DISTRIBUTION: Lincoln National Forest. Occurs in Guadalupe Mountains of southeastern New Mexico. Known in the United States only in Slaughter Canyon of the Guadalupe Mountains and the Edwards Plateau in Texas. Five of the six known nesting caves are on the Carlsbad Caverns National Park; the other is on the Guadalupe Ranger District. The winter range is unknown.

HABITAT TYPE ASSOCIATION: Nests in limestone caves in Slaughter Canyon area of the Guadalupe Mountains. The vegetative cover in this area is primarily semi-desert grassland, mostly mixed gramas, with a few shrubs such as beargrass, agave, and cacti. In some places a mixed brush type composed mostly of ceanothus, mountain mahogany and wavy leaf oak dominates.



DISTINGUISHING CHARACTERISTICS: The cave swallow is closely related and very similar in appearance to the common cliff swallow. The only difference is in the markings on the head. The cave swallow has a dark, rusty patch on the forehead and light buffy cheeks and chin, just the reverse coloration found on the cliff swallow.

REPRODUCTION: Nests are in caves and consist of open cup-shaped mud nests on the sides or ceilings. These nests are separate from one another on the walls, as opposed to cliff swallows nests which are grouped together. This species is considered rare in New Mexico. The average clutch consists of 4 eggs, which are white mottled or spotted with brown. Little is known of the incubation and rearing of the young swallows, but in some instances at least, they are known to raise two broods in a single year.

FOOD HABITS: There is no information available on the feeding habits of this species. It is assumed to be similar to that of other members of the genus which feed primarily on insects taken on the wing.

PROTECTIVE MEASURES ALREADY TAKEN: Protected under the Migratory Bird Treaty Act.

MANAGEMENT PROPOSALS:

1. Initiate and participate in studies with the State game and fish department, universities, National Park Service, and interested private groups and individuals in gathering additional life history information, including nesting locations, incubation and rearing of young; population levels and distribution.

2. Conduct Forest field surveys adjacent to Carlsbad Caverns Park in an effort to locate additional caves. Efforts should be made to protect nesting caves from human disturbance.

3. Give species management considerations in all Forest functional activities to prevent habitat degradation or elimination.

4. Special care should be employed in planning and executing projects involving use of pesticides within the feeding range of these birds, which is over open fields and pastures far from their nesting caves.

NOTES

SPOTTED BAT; PINTO BAT

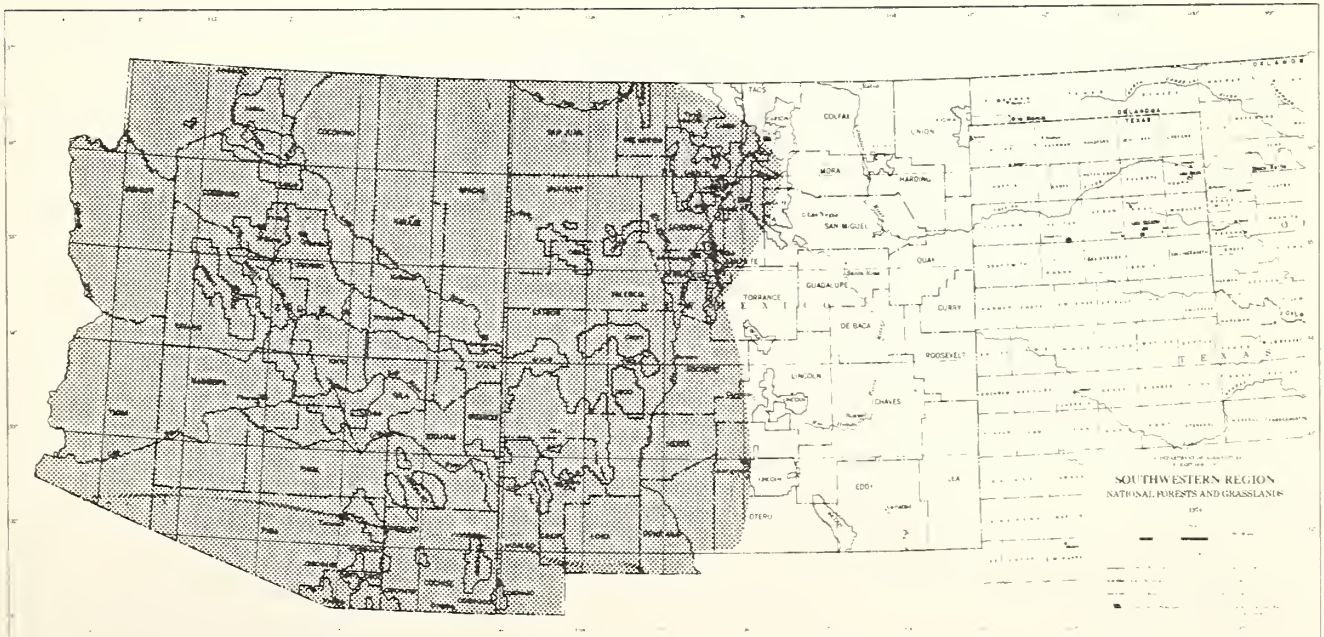
Euderma maculatum (J. A. Allen)

STATUS: Unique; of interest as an uncommon species of which little is known.

REGIONAL DISTRIBUTION: Probably found on all Forests in the Region. The best known locality where these bats have been netted is above the Willow Creek Administrative Site on the Gila National Forest.

HABITAT TYPE ASSOCIATION: Vegetation apparently has no influence on the distribution of this species.

DISTINGUISHING CHARACTERISTICS: These bats are nocturnal in their habits, and are rarely seen unless caught in mist nets. Most activity occurs after midnight and before dawn.



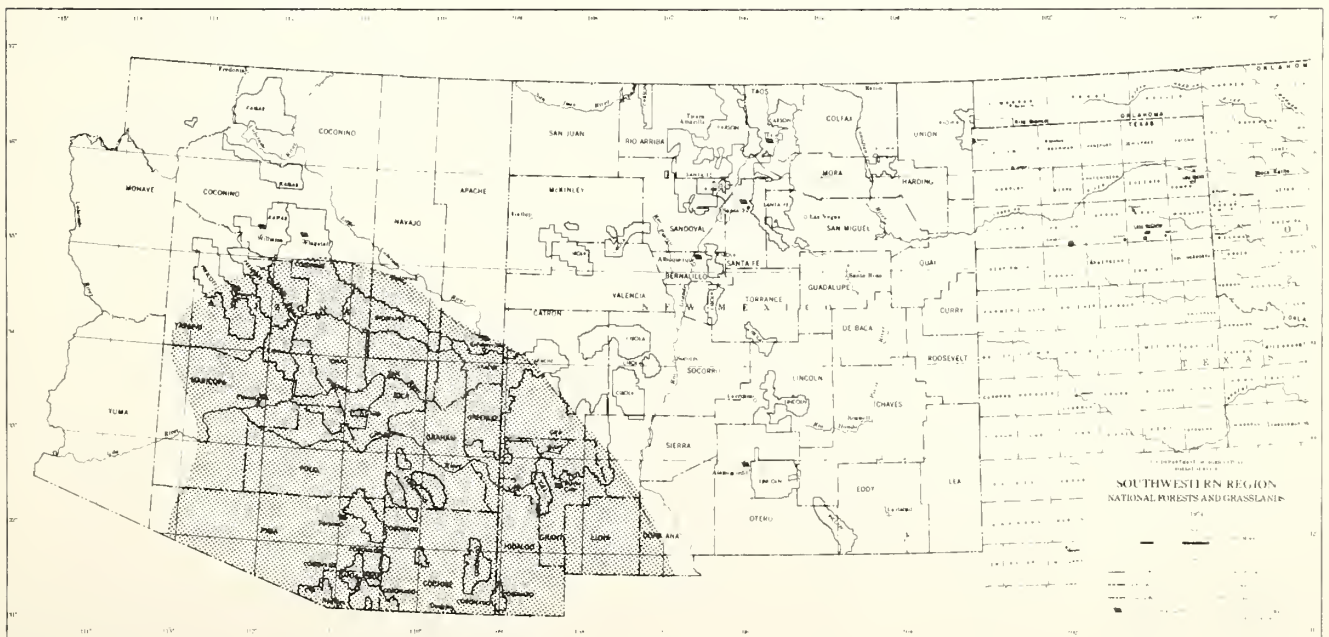
COATI; COATIMUNDI, CHULA

Nasua narica (Linnaeus)

STATUS: Unique; of interest as a peripheral species, of fluctuating numbers and distribution, occurring irregularly north of the international boundary in southern Arizona and southwestern New Mexico. (Group II, New Mexico)

HABITAT TYPE ASSOCIATION: The species is found in brushy oak or southern pinyon-juniper woodland at elevations of 3,000 to 7,000 feet.

DISTINGUISHING CHARACTERISTICS: The coati is somewhat similar in appearance to a raccoon, in color and shape, but has a long slender tail; a long pointed snout, and white patches above and below each eye. The body color is grizzled-brown and the nose is whitish. The combined body and head, are about equal in length to the tail. The tail is carried nearly vertically and is marked by rather indistinct rings. Coatis are good



climbers, are at home foraging in the trees, and usually travel in bands. Although they tend to rest during the day, they are the most diurnal members of the raccoon family.

REPRODUCTION: The species does not mate for life. The gestation period is approximately 77 days and the young are born in litters of four to six. The females do all of the rearing of the young, usually finding a rocky ledge or hollow in a tree which serves as their home. Coatis are gregarious, with very sociable family groups joining to form band of up to 20 or more individuals.

FOOD HABITS: The species, being highly sociable, tends to hunt or forage in groups. The species is omnivorous, but the preferred food is fruit and berries. Many other food stuffs are eaten including bulbs, roots, tender young leaves, insects, worms, scorpions, tarantulas, lizards, small animals and bird eggs. They have a tough nose pad which assists them in rooting for food. They do not wash their food like the common raccoon, although they will occasionally dunk it if water is available.

HAZARDS TO THE SPECIES: Periodic fluctuations in population may be the result of epidemics, possibly of rabies or distemper.

HABITAT REQUIREMENTS: The coati seems to adapt to fairly wide habitat situations. In this country open woodland where trees are plentiful seems to be preferred. While coatis are not as partial to water as the common raccoon, some water seems to be a necessary element in the environment.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Protected by the New Mexico Wildlife Conservation Act of 1974.
2. Protected by State law in Arizona.

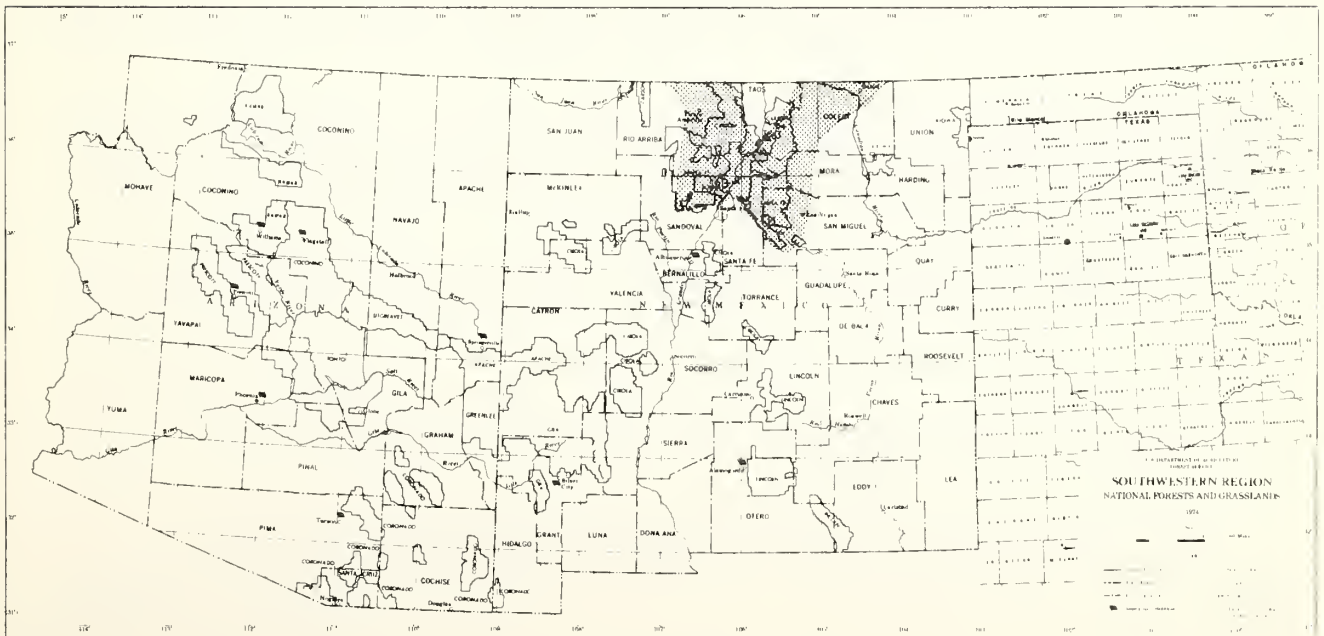
MANAGEMENT PROPOSALS:

1. Continue to monitor population levels and distribution of the species.
2. Continue to give the species management consideration in all planned functional activities.

MARTEN; PINE MARTEN

Martes americana (Rhoads)

STATUS: Unique; of interest as a very rare or possibly extirpated species in New Mexico. (Group II, New Mexico)



REGIONAL DISTRIBUTION: Possibly on the Carson and Santa Fe National Forests. Found primarily in the spruce-fir type of the Sangre de Cristo Mountains. Last reported sighting was in the fall, 1967, on Gascon Point in the Pecos Wilderness of the Santa Fe National Forest. This species is considered rare in the State of New Mexico.

HABITAT TYPE ASSOCIATION: The marten is a tree dwelling member of the weasel family. It prefers dense stands of timber, and is found in the high mountains in mixed conifer and spruce Forests.

DISTINGUISHING CHARACTERISTICS: The species is typically weasel-like in appearance, a little larger than a squirrel, with rich, dark, yellowish brown fur, darker brown legs and tail. The tail is cylindrical and bushy rather than flat. The underside is lighter in color with a light buff colored throat and breast. The ears are broad and rounded and may be edged with whitish hairs. A good climber the marten spends much time in trees, but is also a good forager on the ground.

REPRODUCTION: Martens mate in late July or early August, and the young are born the following April. Litters may vary in number from one to five, but three or four is the average number. The female makes a grass and moss lined nest, usually in a hollow tree, but it may rarely be placed in an underground burrow. When born the young weigh only about one ounce, and their eyes remain closed for 5 to 6 weeks. They are weaned shortly thereafter. Young martens may breed the first year.

FOOD HABITS: These animals are carnivorous and are said to be both diurnal and nocturnal in their habits. Small mammals, mainly red squirrels, and birds make up most of the diet, but this may be varied with insects, fruits, and nuts.

HAZARDS TO THE SPECIES: Human disturbance is probably the biggest detrimental factor to martens. Not only are they easily trapped and the pelts highly desirable, but the presence of human habitation is distasteful to these animals and they disappear from an area before it is well settled. Martens can escape most predators, however, bobcats and great horned owls may occasionally take one.

HABITAT REQUIREMENTS: Specific requirements are unknown, but most references refer to their arboreal habits, and emphasize association with "deep woods." In New Mexico, the fir and spruce of the Canadian and Hudsonian Zones seem to be the preferred habitat.

PROTECTIVE MEASURES ALREADY TAKEN: Protected by the New Mexico Wildlife Conservation Act of 1974.

MANAGEMENT PROPOSALS:

1. Conduct cooperative winter surveys to determine habitat, population levels, and distribution.
2. Careful examination of proposed timber sales in the Spruce type for possible marten occurrence should be conducted on the Carson and Santa Fe National Forests.

BLACK-FOOTED FERRET

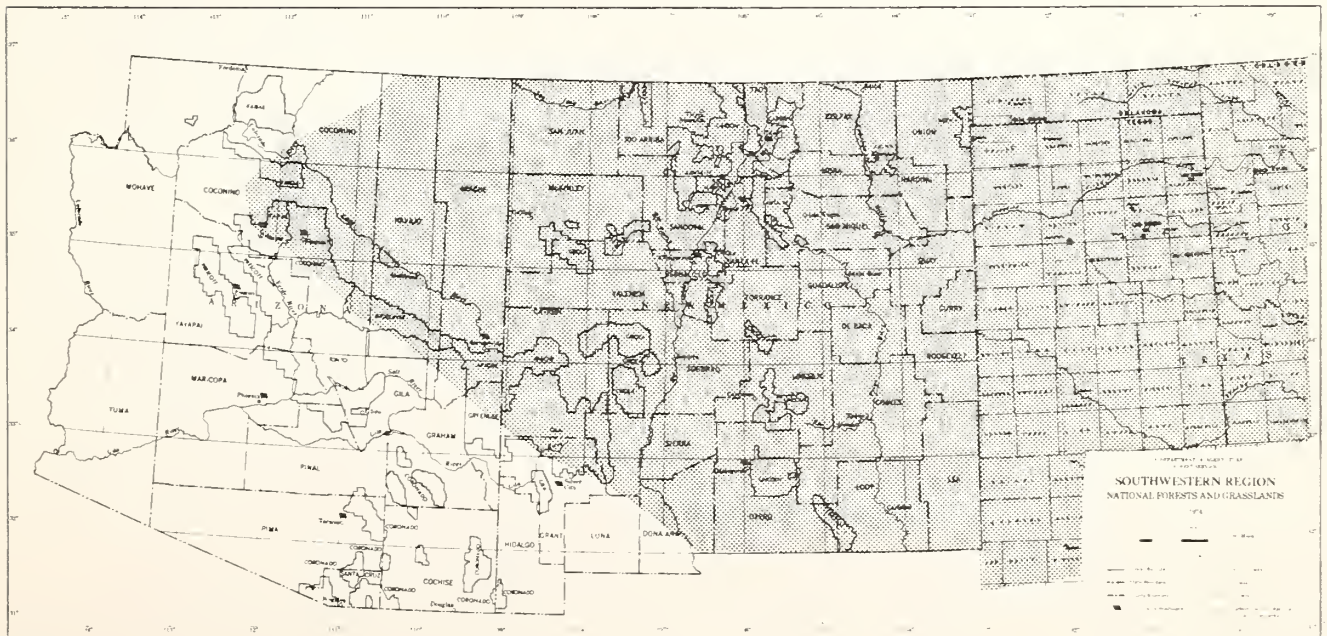
Mustela nigripes (Audubon & Bachman)STATUS: Endangered, (Group I, New Mexico)

REGIONAL DISTRIBUTION: Formerly present on each National Forest and National Grassland, except the Coronado, in association with prairie dog towns. Lack of authenticated recent reports indicate the species may now be extirpated in Arizona and New Mexico.

HABITAT TYPE ASSOCIATION: The Black-footed Ferret lives in association with prairie dogs in grassland plains and surrounding mountains to 10,500 feet elevation.



BLACK-FOOTED FERRET



SIGNS OF SPECIES' PRESENCE: The Black-footed ferret tends to be primarily nocturnal, especially during the summer months. Although they do most of their hunting at night they may bask in the mid-morning sun. They may carry on more daytime activity in the spring and fall. The type of habitat utilized by these ferrets makes it very difficult to locate and identify their tracks. Tracks can best be observed in the snow. These tracks are an average of 12 to 16 inches apart in a normal bounding gait and are very similar to mink tracks. In digging out a prairie dog burrow, or in excavating one of its own, the ferret backs out with dirt held against its chest, dragging dirt farther from the entrance of the burrow each trip. This results in a typical trench, 3-5 inches wide, and at times up to 11 feet long. These trenches are one of the best indicators of the presence of ferrets in a dog town, since no other species in the community leaves this type of structure.

If a ferret is active in a dog town during the day, the prairie dogs stay above ground and appear to be very agitated. The prairie dogs will frequently cover up a burrow occupied by a ferret, or where its recent presence is indicated by odor. They may also obliterate the trench. This apparently causes no difficulty to the ferret in digging out.

DISTINGUISHING CHARACTERISTICS: The Black-footed Ferret is a large weasel with a striking black mask across the face. The feet, legs to the shoulder and terminal fourth of the tail are also black. The upper parts are buffy yellow, with some dark brown hairs on the back and top of the head. The underparts are lighter, cream or buff colored. The total length of the male is 21 to 23 inches, female slightly smaller. They have large eyes and ears, and relatively short legs, with strong digging claws on the forepaws. Artificial light casts a green reflection from their eyes after dark. Ferrets weigh from 1 1/2 to 3 1/2 pounds. Care must be taken in making sight identification so as not to confuse the Black-footed Ferret with the closely related "masked" or "bridled" weasel, which also has contrasting black and white markings on the face. However, the Bridled Weasel does not have the black feet which are characteristic of the Ferret.

REPRODUCTION: Very little is known about the mating habits of the Black-footed Ferret. Based on the assumption that this species has the same 42 day gestation period as the domestic fitch ferret, mating is believed to occur in April or May. The male separates from the female after mating, although he may remain in the same prairie dog town. The female alone rears the young. The young remain in the burrows until they are about half grown. They rarely emerge in the daytime, and are quite shy about leaving the burrow at first. The young may start to hunt for themselves by early August. By late August or early September the young are nearly adult size, and begin to separate from family groups. Ferrets do not hibernate. Litters apparently range from 3 to 5 or possibly 6, with an average of 4. There is only one litter per female per year.

FOOD HABITS: Prairie dogs are by far the preferred food source making up over half of their natural diet. They are also known to eat ground squirrels, jack rabbits, ground birds, like meadowlarks, horned larks, burrowing owls, pocket gophers, deer mice, snakes and insects. Some observers state that they apparently will not live indefinitely on an alternative food source, (i.e. other than prairie dogs). However, in captivity they have eaten commercial mink food, fish, liver, hamburger, pork, milk, rabbit and bread. Ferrets are thought to feed mostly at night and below ground. Wild ferrets have never been observed to drink water, although they do drink water in captivity.

HAZARDS TO THE SPECIES: Known and suspected predators of ferrets, other than man, are badger, domestic dog, coyote, domestic cat, owls, bobcats, prairie rattlesnakes, hawks and eagles. Man, however, is probably responsible directly or indirectly for the most mortality. Ticks, fleas, lice, nematodes, and mites are known parasites of ferrets. How these parasites are related to occurrence of disease in ferrets is not yet known. The loss of suitable habitat, mainly prairie dog towns, is the greatest single factor which has led to the decline in ferret numbers.

HABITAT REQUIREMENTS: Historically there is a close relationship between the range of the ferret and that of the prairie dog. This continues to hold true. There is a definite and primary association of ferrets with prairie dogs and prairie dog towns. At the time of family dispersal observations of ferrets have been made in buildings, under haystacks, and in alfalfa fields, but these are thought to be only temporary. There is no evidence whether wild ferrets can live indefinitely on food sources other than prairie dogs.

Prairie dog burrows provide not only the food source for ferrets, but also protection and modification of inclement weather conditions, and at least some degree of protection from predators. The burrows also provide environment in which the ferrets may rear their young. Researchers have concluded that ferrets have never been abundant and the close association with prairie dogs may be involved in an adaption to prevent the ferrets' over exploitation of its food supply. Areas that are good prairie dog habitat and have prairie dogs living in them evidently are good ferret habitat.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Protected by the Endangered Species Act of 1973.
2. Protected by the New Mexico Wildlife Conservation Act of 1974.
3. Protected by State law in Arizona.
4. Preservation of grassland habitat where prairie dog towns and ferrets are present.

MANAGEMENT PROPOSALS:

1. Map all existing and past prairie dog towns on National Forest land.
2. Inspect all prairie dog towns for ferret existence in cooperation with the U. S. Fish and Wildlife Service, and New Mexico Department of Game and Fish.
3. Conduct an I&E program to inform the public of the status of the ferret and its relationship to prairie dog towns.
4. Preserve grassland habitat and provide protection through management unit designation where appropriate.

NOTES

ARIZONA PRAIRIE DOG

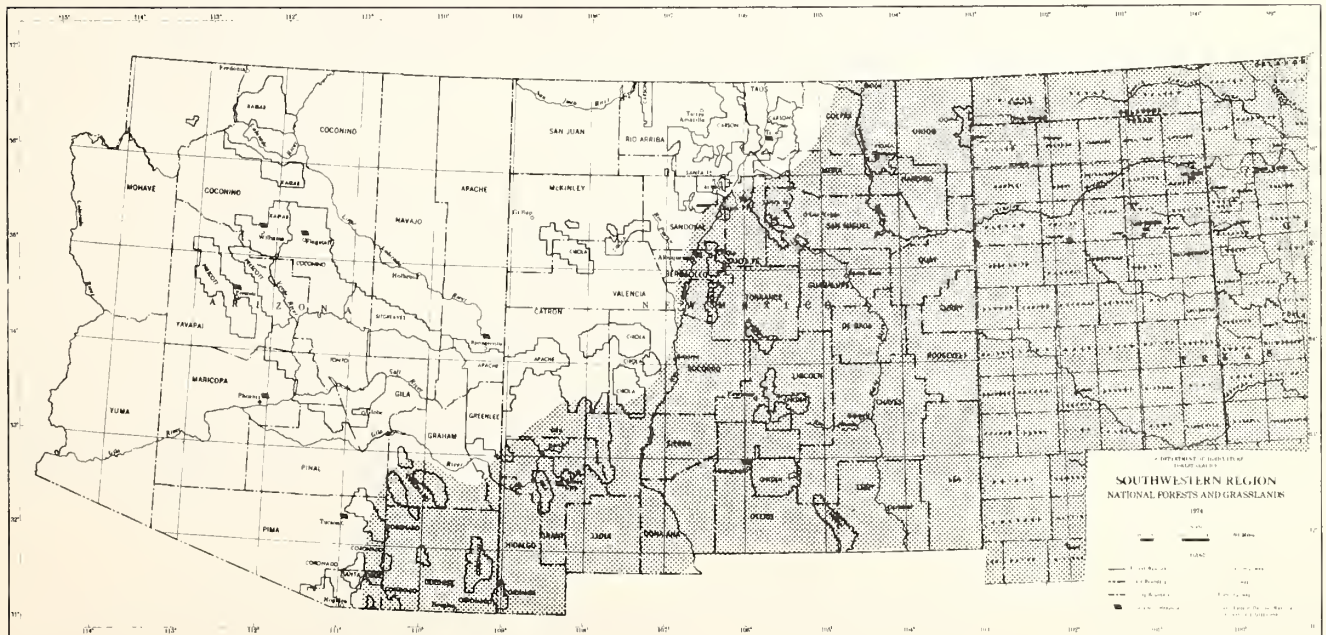
Cynomys ludovicianus arizonensis (Mearns)

STATUS: Unique; of interest because this formerly numerous and widespread species is now very rare if not extinct throughout its range. Pictured is the Black-tailed prairie dog. The Arizona prairie dog is a sub-species that occurs on the extreme southwestern part of the range of the species. (Group II, New Mexico)

In the absence of a photo for this species, the Black-tailed prairie dog whose appearance is nearly identical is shown.



Black-tailed Prairie Dog



REGIONAL DISTRIBUTION: Formerly found on the Coronado, Apache, Cibola, Gila, and Lincoln National Forests. This species is now thought to be extinct in Arizona; and very local, if at all present, in New Mexico.

HABITAT TYPE ASSOCIATION: The species prefers flat, dry open grasslands of mesa tops or valley bottoms within the broad limits of the Upper Sonoran Zone. Formerly the species was spread from the creosote bush and semidesert grassland and brush to the lower fringe of the pine type.

DISTINGUISHING CHARACTERISTICS: The species is a stout-bodied, short-tailed ground squirrel with broad rounded head and low rounded ears. It is highly social in habit, forming large colonies or "towns." The species makes a characteristic barking sound. The fur is yellowish tan in color, lighter on the underside and the tip of tail for about a third of its length is black. It characteristically sits erect on top of the mound at the entrance to its burrow to survey approaching danger, delaying entry until the last possible instant. They are active during the day and have well established procedures for protecting family home territory.

REPRODUCTION: Mating begins the last week of January and continues for 15 to 20 days. The young dogs are born in March or April following a gestation period of 28 to 32 days. They are naked and blind at birth. The eyes do not open until they are about 5 weeks old. Litters average four or five pups, and most researchers believe there is only one litter a year, although some dogs are late breeders so the pups are born later in the year. The young begin to appear above the ground around the end of May and are about half the size of adults. They grow rapidly and by the end of summer have reached nearly full adult size. They do not breed, however, until they are 2 years old. The breeding potential is high, and small populations can build rapidly under favorable habitat conditions.

FOOD HABITS: Prairie dogs are primarily vegetarians, subsisting largely on grasses and green vegetation or roots. Gramas and associated species seem to be preferred. At times they became somewhat omnivorous and eat grasshoppers and other insects in addition to native vegetation. Vegetation is consumed in the vicinity of a "dog town," and if the colony is near a grain field much damage will occur.

HAZARDS TO THE SPECIES: Many species of predators prey on prairie dogs, but an excellent system of lookouts and signals frequently enables them to avoid capture by coyotes, eagles, and large hawks. Their greatest losses to natural enemies are to those that can dig them out of their burrows, such as badgers and black-footed ferrets. It is suspected the poisoning programs of the late 1930's, habitat destruction, and to some extent sport shooting have probably been the big factors responsible for the present depleted population.

HABITAT REQUIREMENTS: Although the preferred habitat seems to be dry upland prairies, past history indicates that they are adaptable to a fairly wide range of habitat conditions.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Protected by the New Mexico Wildlife Conservation Act of 1974.
2. Protected by State law in Arizona.

MANAGEMENT PROPOSALS:

1. Initiate and conduct field surveys to determine whether this subspecies still exists on any of the National Forest in the Region.
2. Initiate or support interagency studies with State Game and Fish departments, Bureau of Land Management and the U. S. Fish and Wildlife Service to determine distribution, population level and habitat being utilized by remnants of this subspecies.
3. Conduct a joint environmental analysis with the Bureau of Land Management and Arizona Game and Fish Department to determine possibility and feasibility of attempting to reestablish the subspecies in Arizona.
4. If any colonies of Arizona prairie dogs are discovered, establish special management units to perpetuate colonies.
5. Coordinate Forest functional activities, particularly grazing, to give management considerations to this species.

NOTES

KAIBAB SQUIRREL

Sciurus kaibabensis (Merriam)

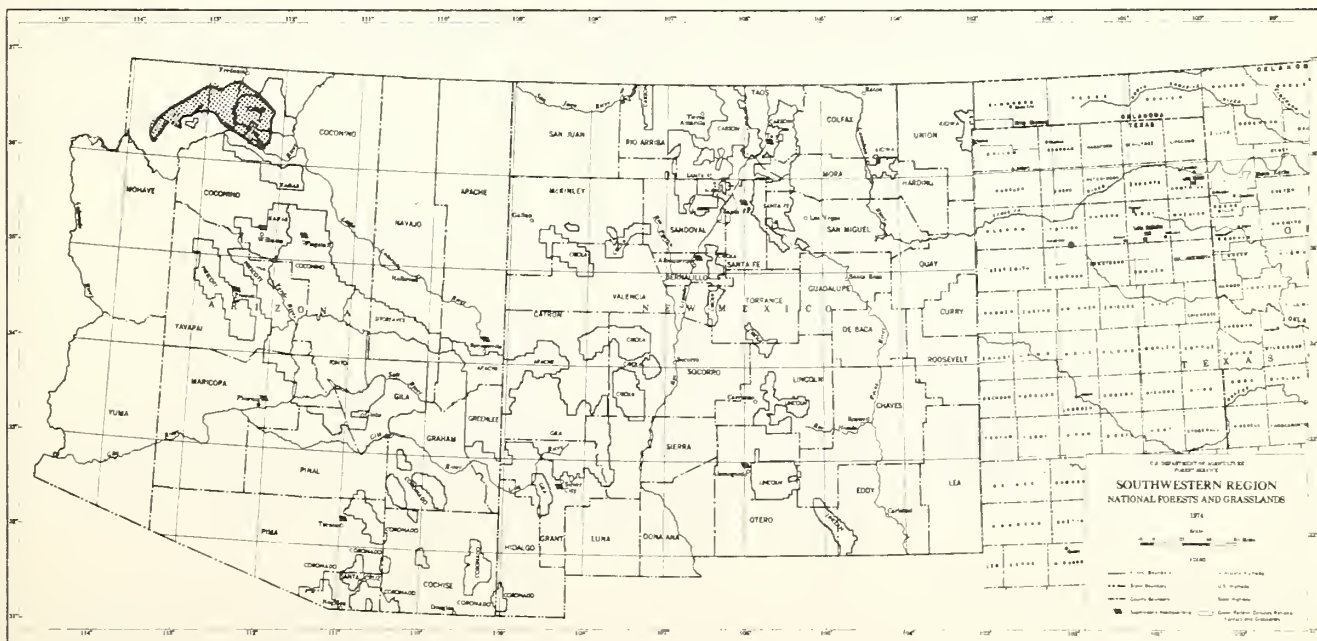
STATUS: Unique; of considerable interest because of its distinctive markings, its evolutionary development, and its isolated and limited range.

REGIONAL DISTRIBUTION: Kaibab National Forest. Found only north of the Grand Canyon on the Kaibab Plateau within Grand Canyon National Park and the Kaibab National Forest.

HABITAT TYPE ASSOCIATION: The kaibab squirrel is dependent upon mature ponderosa pine timber for feeding and nesting purposes.



Kaibab Squirrel



DISTINGUISHING CHARACTERISTICS: This is a large, tufted-eared, tree squirrel, with black underparts and a white tail both above and below. There is a rusty colored patch on the back, and the sides and face are grizzled gray mixed with black. Lower sides and upper part of forelegs and thighs are black. These squirrels are gregarious, several grown squirrels often occupying a single nest. They are shy and difficult to approach, and will lie flat on a horizontal limb for extended periods of time to escape detection. They tend to select favorite feeding trees, which can be readily identified by the accumulation of peeled twigs and clippings under them.

REPRODUCTION: There are still some gaps in our knowledge of the biology of this species. A litter usually consists of three or four young, who continue to live in the nest until full grown. Nests are usually large, bulky structures made of twigs, leaves, and needles and lined with grass and bark. These are usually placed high in pine trees surrounded by other pines whose crowns overlap with the nest tree.

FOOD HABITS: The principal food of the Kaibab squirrel is the seeds and tender bark from the new growth of ponderosa pine. Mushrooms are also used extensively when they are available, these may even be stored and later recovered during the fall and winter months. Some other items such as fruits, seeds, and roots, and possibly young birds or eggs may be taken at times.

HAZARDS TO THE SPECIES: Natural predators for the most part consist of various hawks, and to some extent bobcats and coyotes. Other predators are thought to be of little concern. Our knowledge of exact causes of loss due to predators, parasites, disease, and human factors is very limited. We do know that some such losses do occur. Habitat modification could result in population decline.

HABITAT REQUIREMENTS: The habitat of the Kaibab squirrel is limited to about 264,000 acres of ponderosa pine timber type on the Kaibab Plateau. Groups of mature ponderosa pine which provide nest and escape trees with overlapping crowns are necessary elements of Kaibab squirrel habitat. Single, mature trees do not provide for nesting requirements. These squirrels also have preferred feeding trees, usually advanced black jacks, which provide the bulk of their food. These must be reserved, along with acorn producing Gambel oak.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Protected by State law in Arizona.
2. Coordination measures in the multiple use plan for the North Kaibab provide for management of Kaibab squirrel habitat.
3. Continuing studies on various aspects of the species biology.
4. Transplant of the species into the Mt. Trumbull area in 1971 and again in 1972 by the Arizona Department of Game and Fish in cooperation with the Kaibab National Forest. The population appears to have established itself in this area (now under the jurisdiction of the Bureau of Land Management).

MANAGEMENT PROPOSALS:

1. Continuance of complete legal protection.
 2. Preservation and protection of yellow pine stands which provide the squirrels food supply.
 3. Continue field studies in cooperation with the Arizona Game and Fish Department and colleges and universities to determine population levels and ecological requirements.
 4. Conduct timber management operations to benefit squirrel habitat by leaving optimum sized nesting trees and retaining all food cache trees.
 5. Restrict other Forest resource management programs to limit, as much as possible, physical disturbance of the squirrels' habitat.
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NOTES

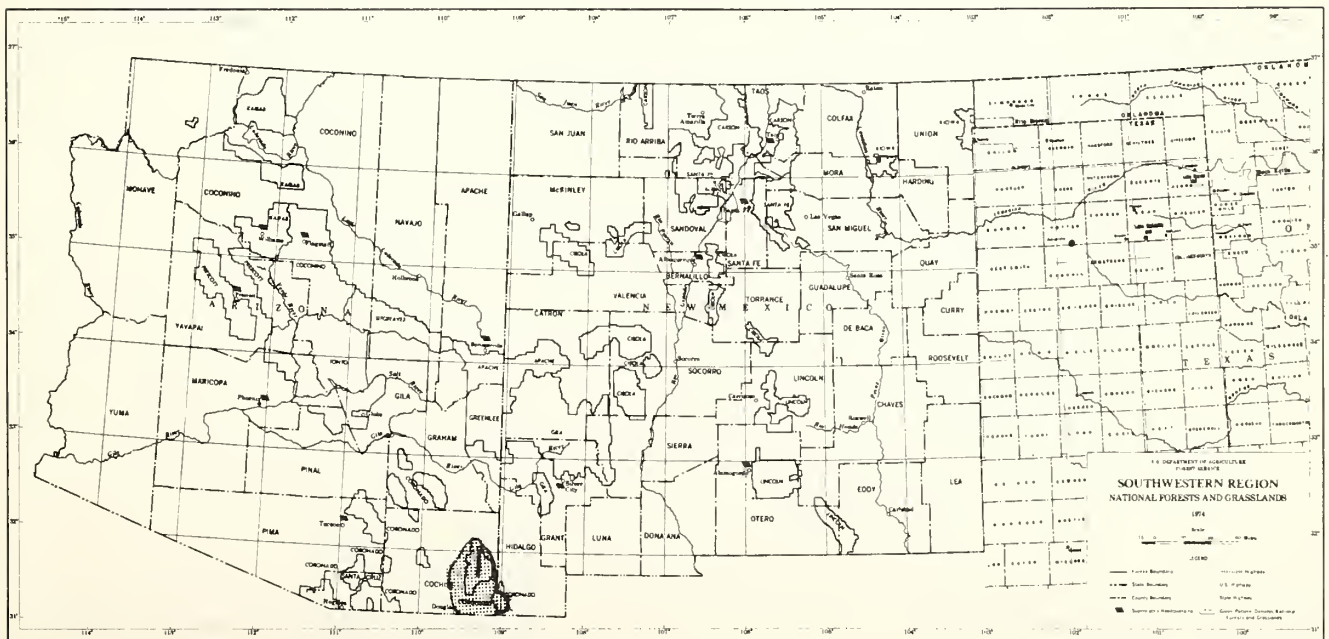
CHIRICAHUA SQUIRREL;
APACHE FOX SQUIRREL

Sciurus apache chiricahuae (Goldman)

STATUS: Unique; of interest as a rare, peripheral species of very limited range in the United States.

REGIONAL DISTRIBUTION: Coronado National Forest. This species is found only in the Chiricahua Mountains of southeast Arizona and southward into Mexico.

HABITAT TYPE ASSOCIATION: The species inhabits dense thickets of canyon bottom hardwoods of the Upper Sonoran and Transition Zones.



DISTINGUISHING CHARACTERISTICS: This squirrel is most easily recognized in its winter pelage, when it has a broad black band running all the way down the back from the top of the head to the base of the tail. The sides of the body and head are dark yellowish grey grizzled with black. The under surface of the body and the feet are a dull brownish yellow. There are yellowish hairs at the base of the tail and the soles of the feet are purplish. The summer coat does not show the black strip which is hidden by the yellowish or hoary tipped hairs, and the overall appearance has a grizzled effect.

REPRODUCTION: More data is needed. Early investigators found nests in the oak zone.

FOOD HABITS: Not fully known, seems to have a strong preference for acorns of the silverleaf oak.

HAZARDS TO THE SPECIES: Unknown

HABITAT REQUIREMENTS: Not fully known, is said to favor Sycamore stands from among the riparian types. The species is observed in or near canyon hardwoods, foraging into the adjacent oak woodland at elevations of 5,500 to 7,000 feet. It has been sighted at 8,600 feet at Rustler Park.

PROTECTIVE MEASURES ALREADY TAKEN: The species is under general protection of Arizona State law.

MANAGEMENT PROPOSALS:

1. Initiate and participate or support studies by the Arizona Game and Fish Department and universities to gather life history data, habitat requirements, population levels and distribution.

2. Give the species management consideration in all Forest functional activities where habitat disturbance may occur, with special emphasis on protection and perpetuation of canyon bottom riparian species of the Upper Sonoran Zone.

NOTES

GUADALUPE MOUNTAIN VOLE
GUADALUPE MEADOW MOUSE

Microtus mexicanus guadalupensis (V. Bailey)

STATUS: Unique; of interest as a common species with a limited range.

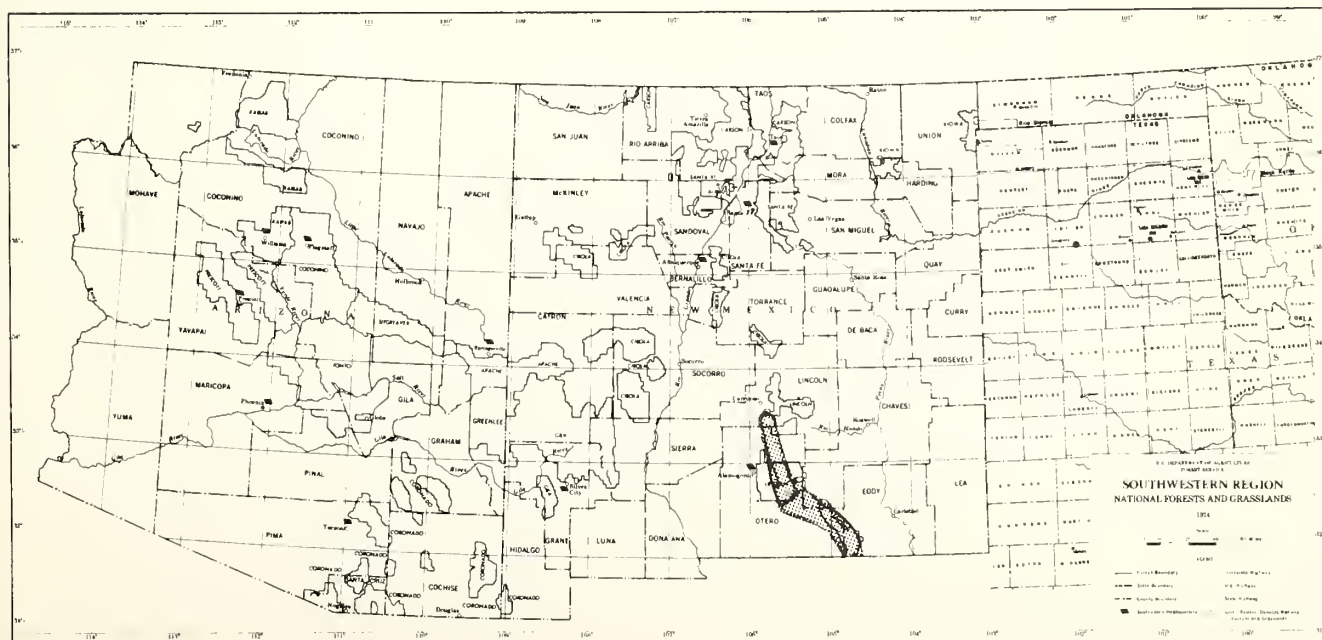
REGIONAL DISTRIBUTION: Lincoln National Forest. Found in the Sacramento Mountains, and south into Texas, usually occurring in high mountain meadows and parks in ponderosa pine forests between 7,500 - 8,500 feet elevation. Studies indicate that this species occurs in localized areas within the Forest and population levels are abundant within these areas.

HABITAT TYPE ASSOCIATION: Voles are residents of grassy parks and meadows, where there is a good accumulation of vegetative growth preferable in a rather dry situation.



Meadow Vole

In the absence of a photo for this subspecies, the meadow vole whose appearance is nearly identical is shown.



DISTINGUISHING CHARACTERISTICS: A small to medium-sized mouse, with small ears and a short tail. The upper parts are a dull brown shade, the underpart buffish gray and the tail and feet are a brownish gray.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Restriction of rodent suppression work from known vole colonies.
2. Forest studies to determine life history requirements.

MANAGEMENT PROPOSALS:

1. Continue to cooperate with the New Mexico Department of Game and Fish and support researchers in gathering additional life history information on this species to be aware of any change in species status.
2. Coordinate grazing activities in known areas of vole inhabitation so that management is compatible.
3. Continue to restrict rodent suppression programs in areas where this species occurs.

NOTES

RIPARIAN AND SEMI-RIPARIAN SPECIES:

BLACK HAWK	<u>Buteogallus anthracinus</u> (Deppe)
ZONE-TAILED HAWK	<u>Buteo albonotatus</u> (Kaup)
GRAY HAWK	<u>Buteo nitidus</u> (Latham)
ELF OWL	<u>Micrathene whitneyi</u> (Cooper)
FERRUGINOUS OWL	<u>Glaucidium brasilianum</u> (Gmelin)
RIVOLI'S HUMMINGBIRD	<u>Eugenes fulgens</u> (Swainson)
BLUE-THROATED HUMMINGBIRD	<u>Lampornis clemenciae</u> (Lesson)
VIOLET-CROWNED HUMMINGBIRD	<u>Amazilia verticalis</u> (Deppe)
BROAD-BILLED HUMMINGBIRD	<u>Cyanthus latirostris</u> (Swainson)
WHITE-EARED HUMMINGBIRD	<u>Hylocharis leucotis</u> (Vieillot)
GREEN KINGFISHER	<u>Chloroceryle americana</u> (Gmelin)
SULPHUR-BELLIED FLYCATCHER	<u>Myiodynastes luteiventris</u> (Scalter)
TROPICAL KINGBIRD	<u>Tyrannis melancholicus</u> (Vieillot)
THICK-BILLED KINGBIRD	<u>Tyrannis crassirostris</u> (Swainson)
BUFF-BREASTED FLYCATCHER	<u>Empidonax fulvifrons</u> (Giraud)
VARIED BUNTING	<u>Passerina versicolor</u> (Bonaparte)

The above species are grouped because they share a common role as peripheral species which occur regularly in the southern part of the Region. This represents the northern extremity of their natural range and most of them breed here. They also share a common need for at least part of the year for some or all of the components of a riparian habitat. The specific requirements of the habitat may be for a specific species or group of species, and may be needed for cover, nesting, feeding, or a combination of these, but each must have at least some elements of the riparian habitat if it is to continue as a member of the native avifauna.

STATUS: All of these species are unique, and of particular interest as uncommon visitors from south of the border, which nest and/or spend at least part of the year here at the northern limit of their range.

REGIONAL DISTRIBUTION: With very few exceptions we may expect to find these species only on or in the vicinity of the Coronado and Gila National Forests. These exceptions include the zone-tailed hawk which may occur rarely as far north as the mountainous regions of the Carson and Santa Fe National Forests in New Mexico and the Tonto and Prescott National Forests in Arizona; the black hawk which ranges northward to the base of the Mogollon Rim on the Coconino, Prescott, Tonto and Gila National Forests; the ferruginous and elf owls which range into the Gila River basin; the Rivoli's Hummingbird which may be a casual or accidental visitor to the Sierra Anchas in Arizona and northern New Mexico Forests; the tropical kingbird which may occur casually on the Tonto National Forest; and the varied bunting which may possibly get into the Guadalupe Mountains near Carlsbad Caverns. The most common occurrence of these species will be in the wooded mountain canyons of the Coronado and along the Gila River drainage on the south end of the Gila National Forest.

HABITAT TYPE ASSOCIATION: The common denominator which attracts and holds these species is a good stand of riparian woodland composed largely of deciduous species, with some evergreen oak, preferably with a year long supply of water. Arizona sycamore seems to be a key species, and maintenance of a good range of age classes, including dead-mature trees is highly desirable. In many instances live water, at least during the nesting season appears to be the determining factor in the selection of nesting areas. The owls are also frequently found among the saguaros in the semi-desert brush land.

DISTINGUISHING CHARACTERISTICS: Those characteristics; of plumage coloration, song, and habits which make possible field identification of each species are best found by consulting a good field guide.

REPRODUCTION: This varies with each individual species. Again consultation of good reference books is the best source of known biological data.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Riparian areas on the Gila, Coronado, Tonto and Prescott have been fenced to exclude cattle use in order to enhance the riparian habitat value.

MANAGEMENT PROPOSALS:

1. Be alert to the possible presence of these species, and when they are seen, record the date, location, habitat or cover in which seen, number, sex and age (adult or immature). Sightings of nests including height, species of tree or bush in which built, number of eggs or young, and whether hatch is successful are very important.

2. Give special consideration to the need for riparian habitat by unique wildlife species in all Forest functional projects and plans.

3. Regulate grazing use in riparian type to favor establishment of a full range of age classes of favored perching and nesting tree species. Special priority should be given to management of Arizona Sycamore.

4. Retain and protect hardwood snags to provide perching and nesting sites for riparian dwelling birds.

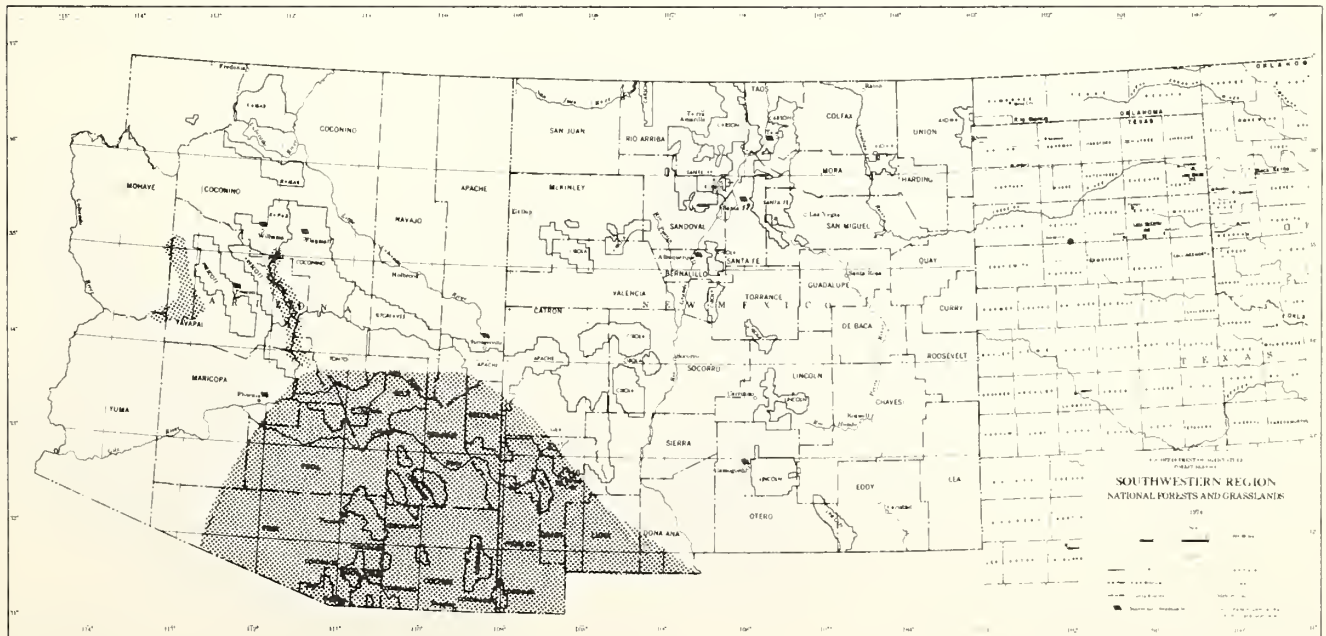
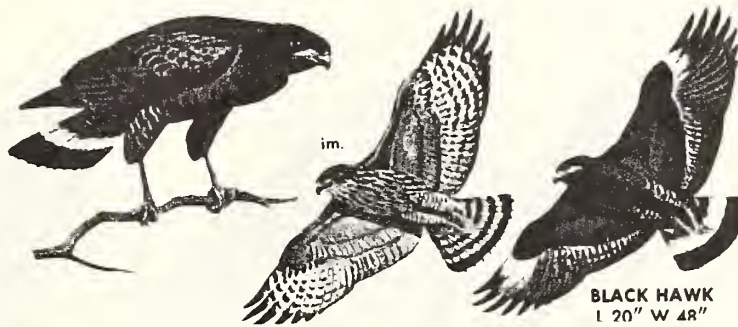
5. Regulate recreation use, and the development and expansion of camping and picnic areas to minimize disturbance of bird nesting areas.

NOTES

RIPARIAN AND SEMI-RIPARIAN SPECIES:
BLACK HAWK

Buteogallus anthracinus (Deppe)

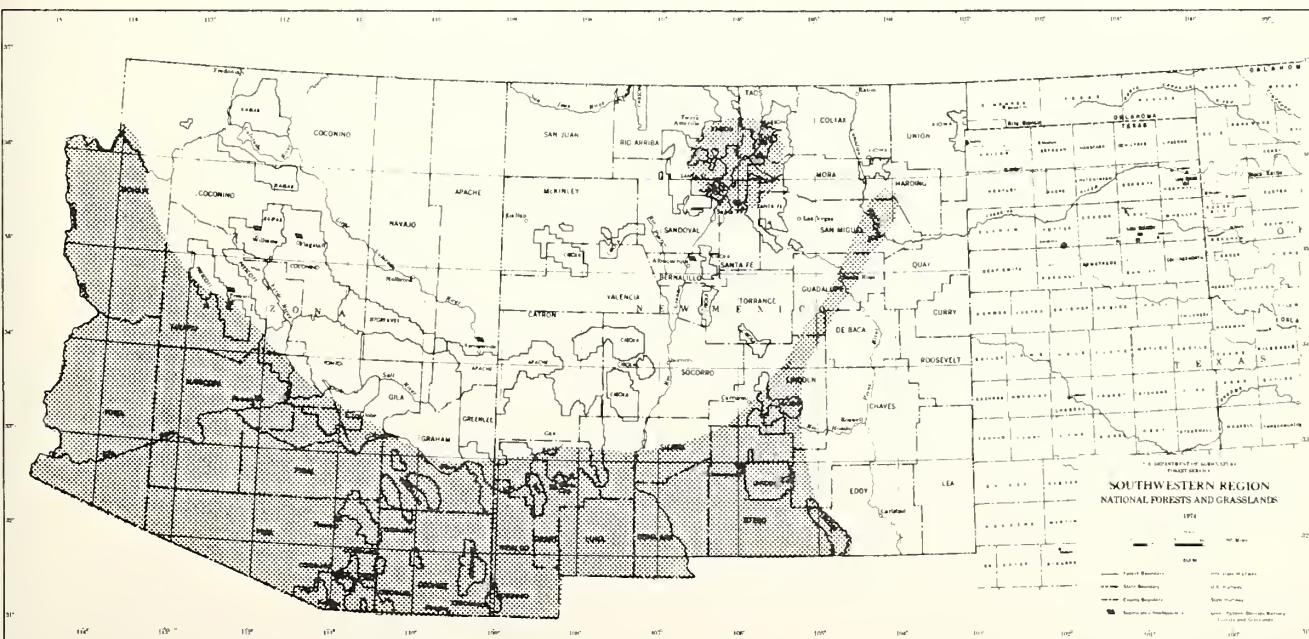
STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range. (Group II, New Mexico)



RIPARIAN AND SEMI-RIPARIAN SPECIES:
ZONE-TAILED HAWK

Buteo albonotatus (Kaup)

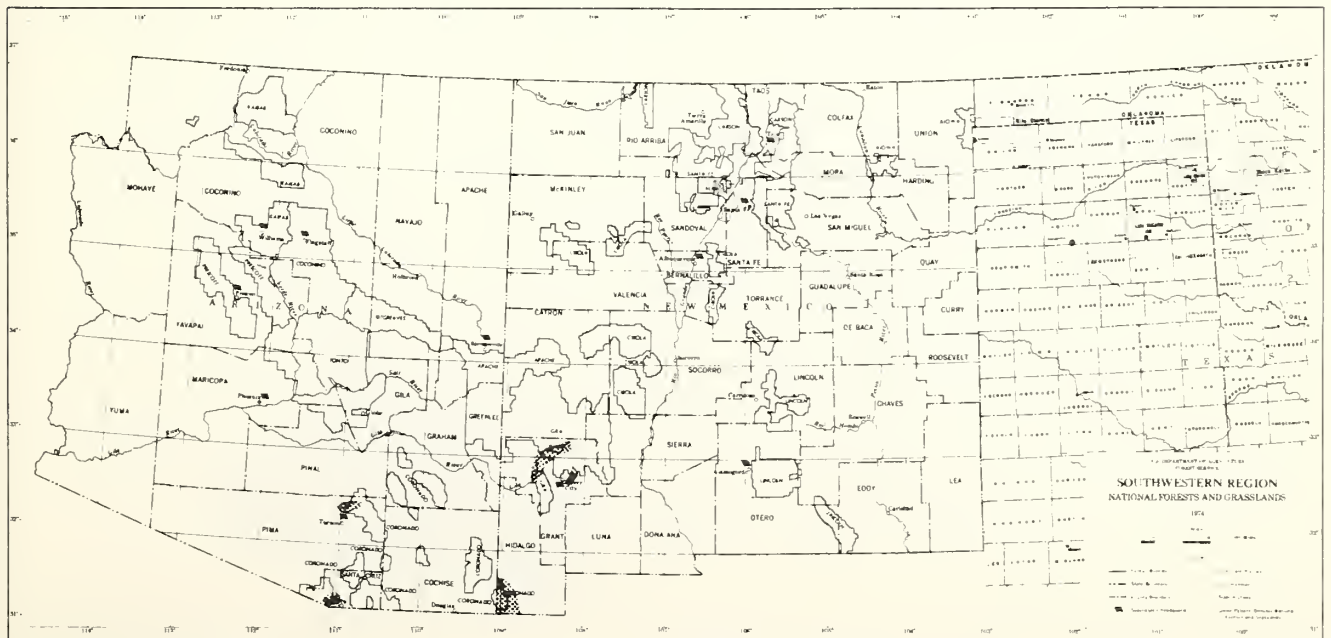
STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range.



RIPARIAN AND SEMI-RIPARIAN SPECIES:
GRAY HAWK

Buteo nitidus (Latham)

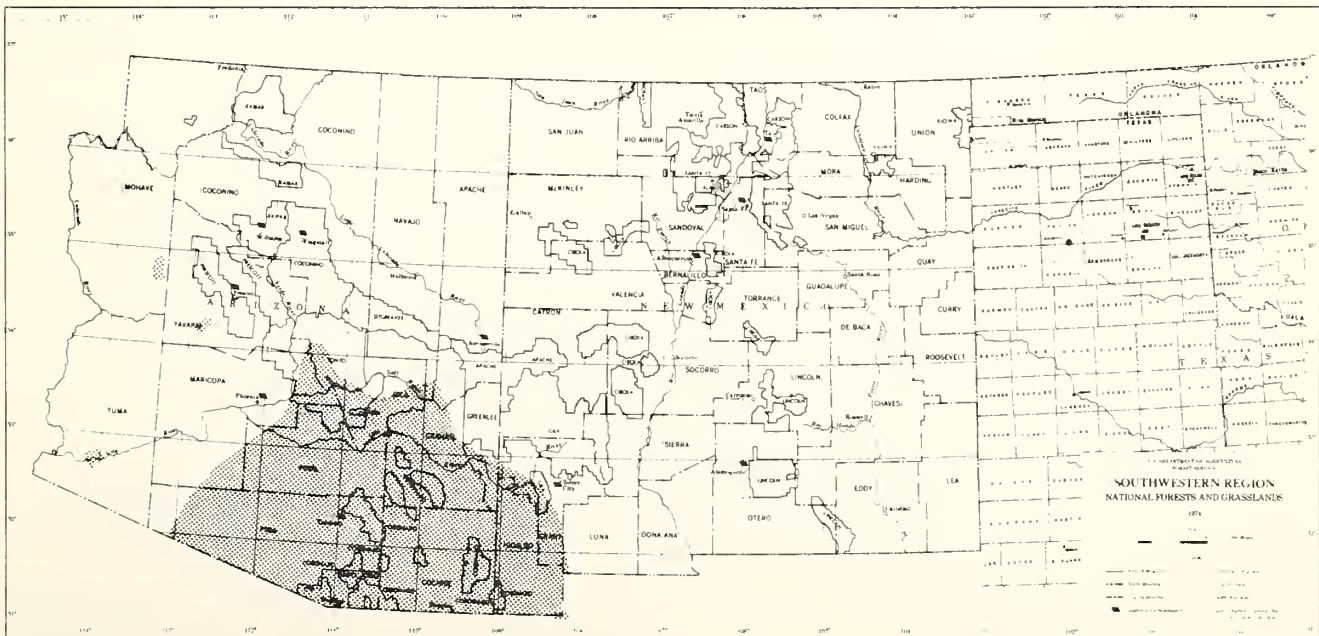
STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range.



RIPARIAN AND SEMI-RIPARIAN SPECIES:
ELF OWL

Micrathene whitneyi (Cooper)

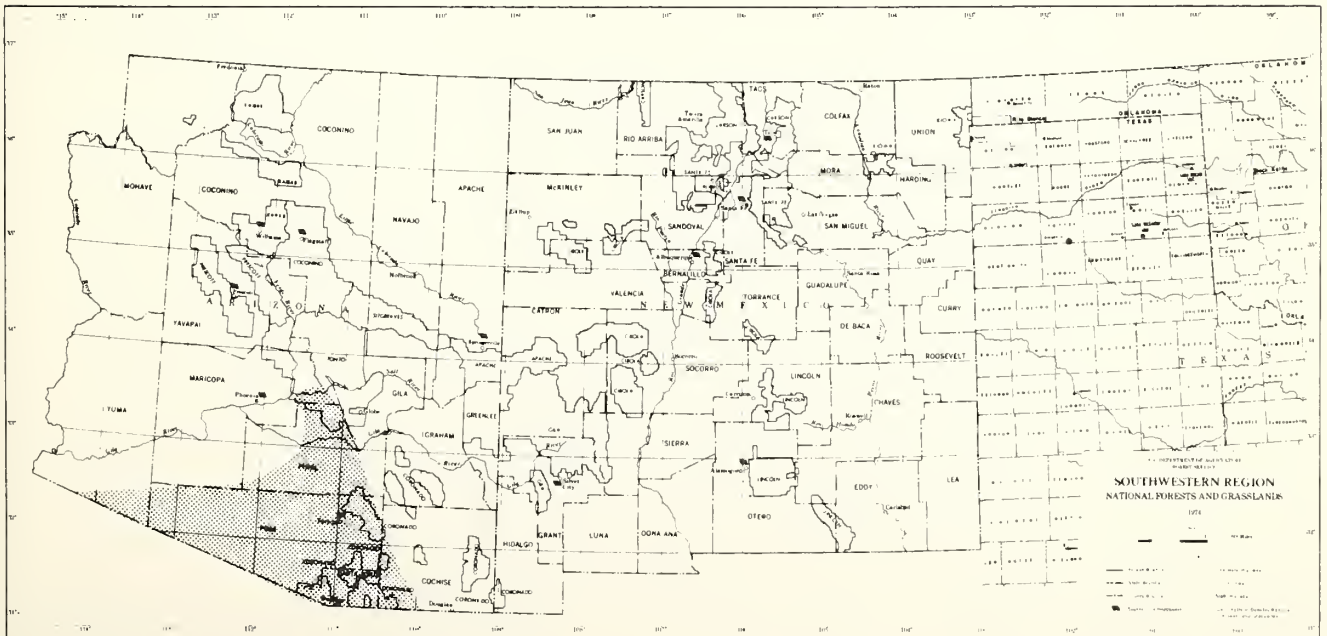
STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range.



RIPARIAN AND SEMI-RIPARIAN SPECIES:
FERRUGINOUS OWL

Glaucidium brasilianum (Gmelin)

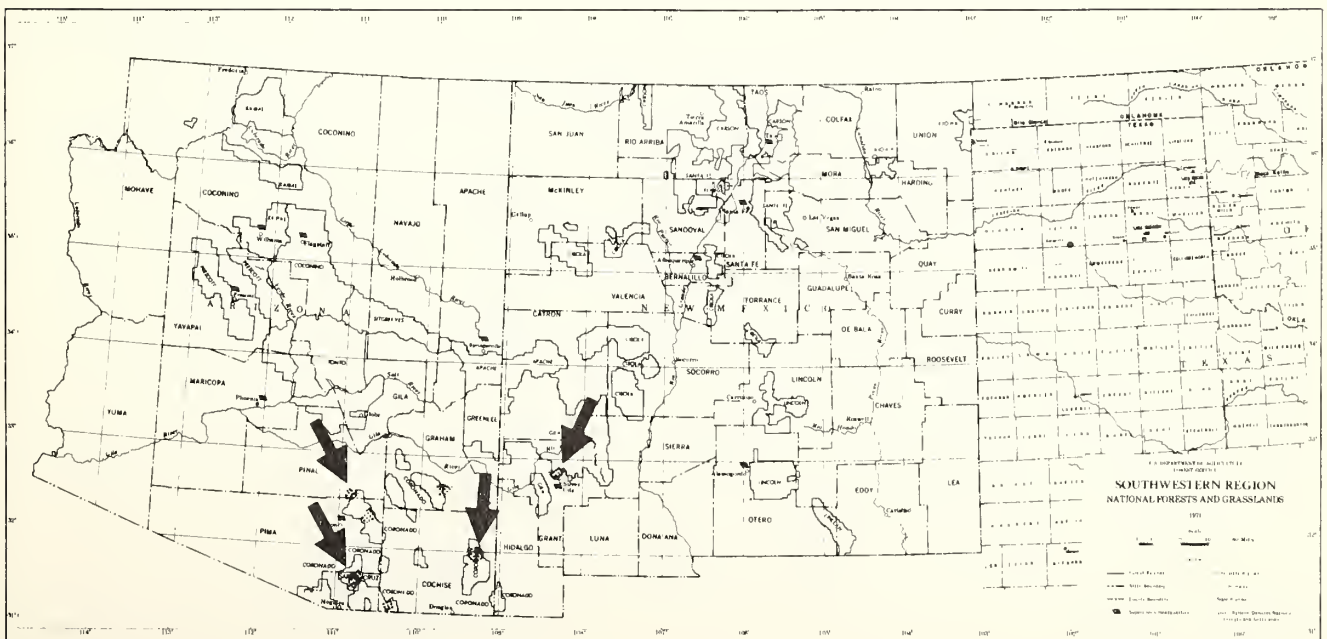
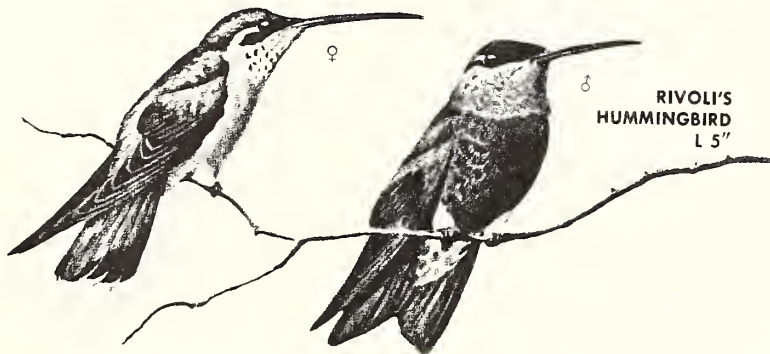
STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range.



RIPARIAN AND SEMI-RIPARIAN SPECIES:
RIVOLI'S HUMMINGBIRD

Eugenes fulgens (Swainson)

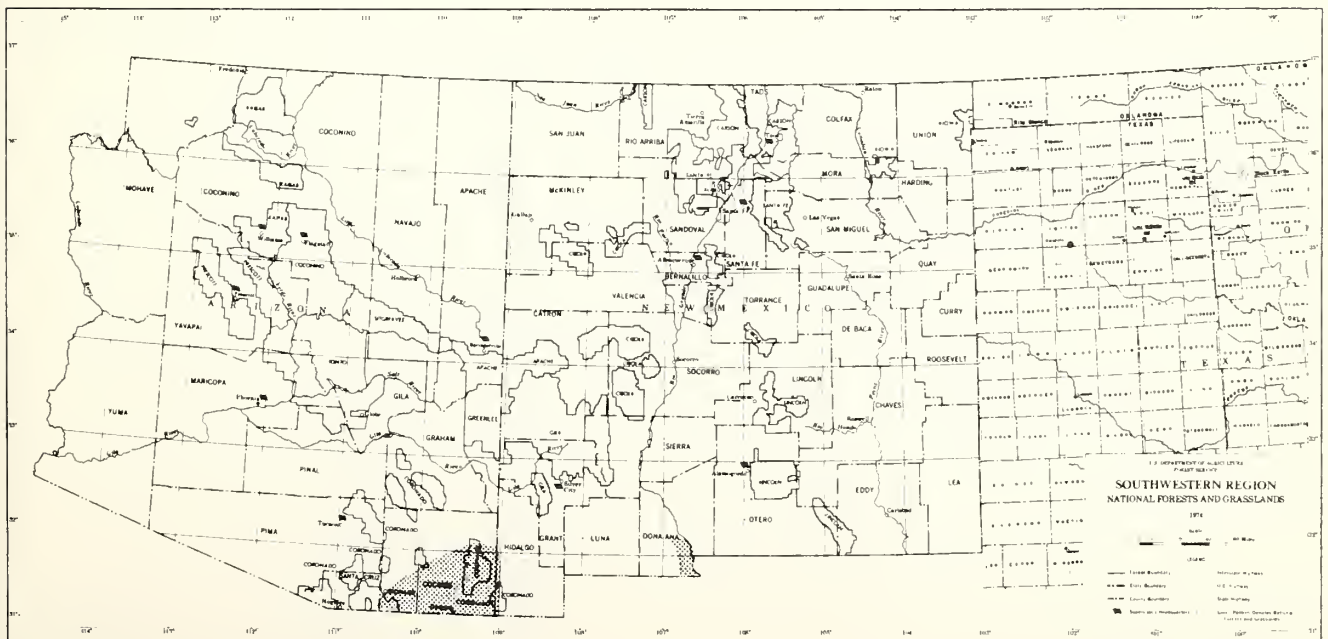
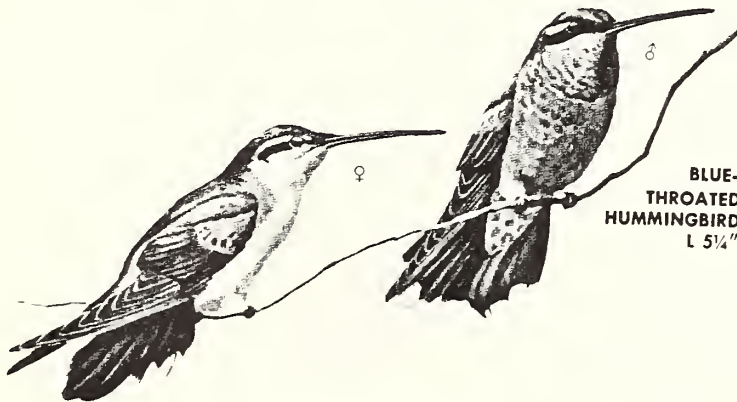
STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range.



RIPARIAN AND SEMI-RIPARIAN SPECIES:
BLUE-THROATED HUMMINGBIRD

Lampornis clemenciae (Lesson)

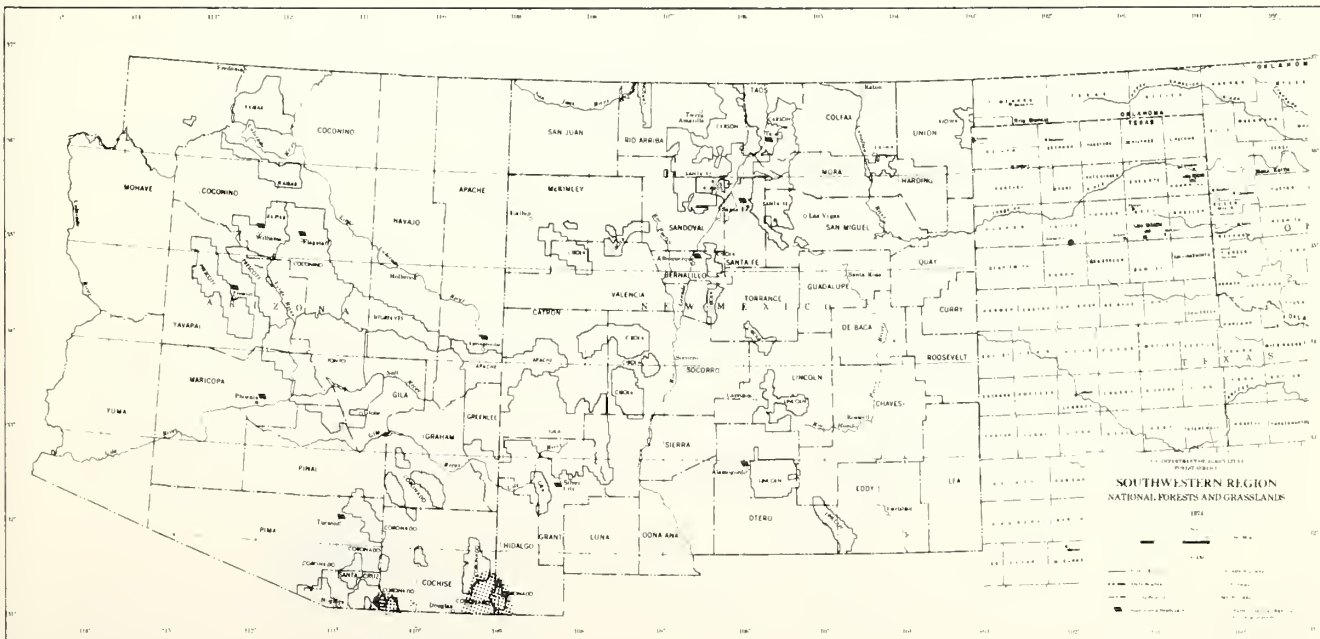
STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range. (Group II, New Mexico)



RIPARIAN AND SEMI-RIPARIAN SPECIES:
VIOLET-CROWNED HUMMINGBIRD

Amazilla verticalis (Deppe)

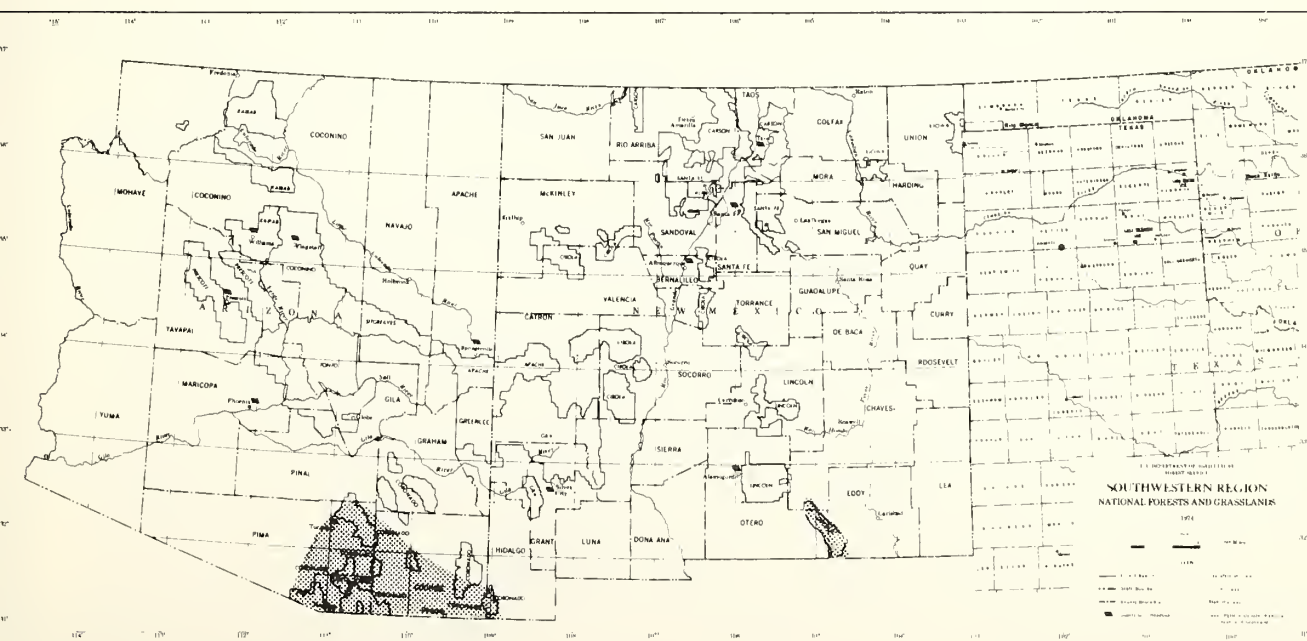
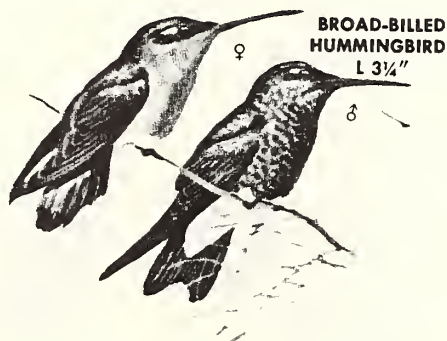
STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range. (Group II, New Mexico)



RIPARIAN AND SEMI-RIPARIAN SPECIES:
BROAD-BILLED HUMMINGBIRD

Cynanthus latirostris (Swainson)

STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range. (Group II, New Mexico)

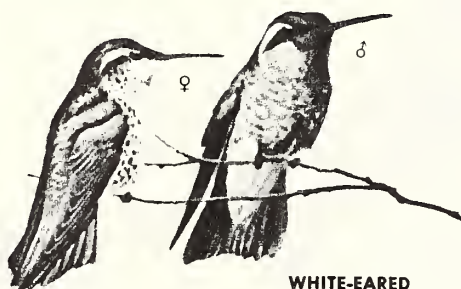


RIPARIAN AND SEMI-RIPARIAN SPECIES:
WHITE-EARED HUMMINGBIRD

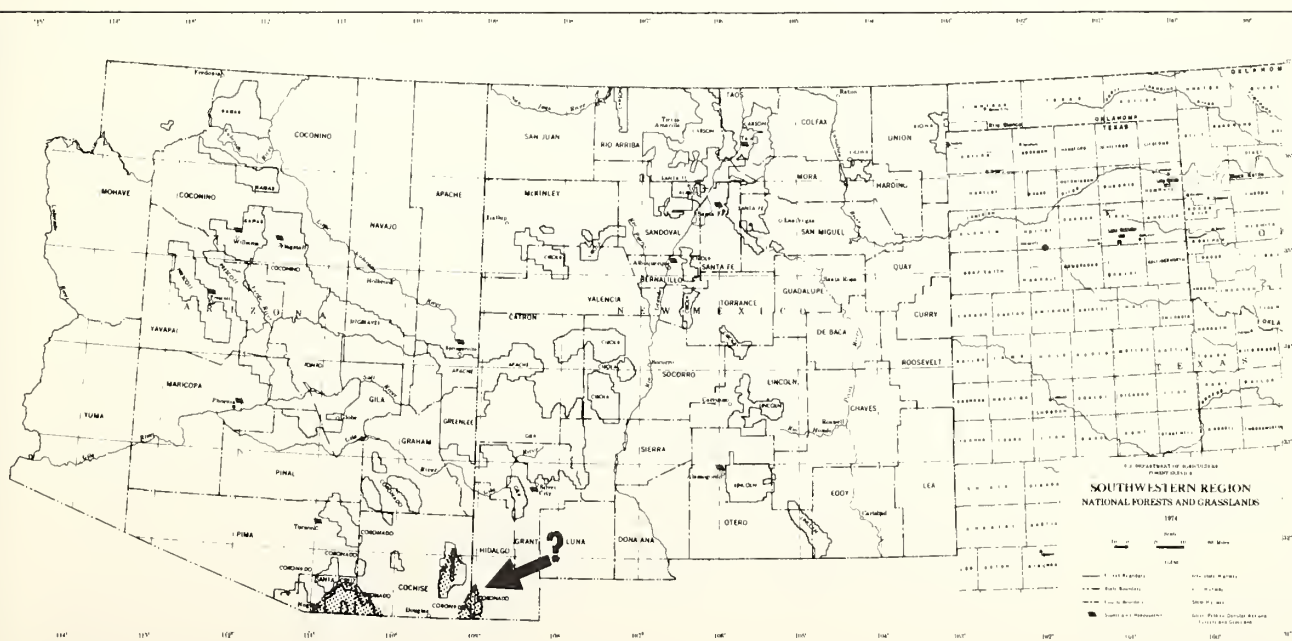
Hylocharis leucotis (Vieillot)

STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range. Extremely uncommon few authenticated sightings.

"Difficult to distinguish from broad-billed hummingbird!"



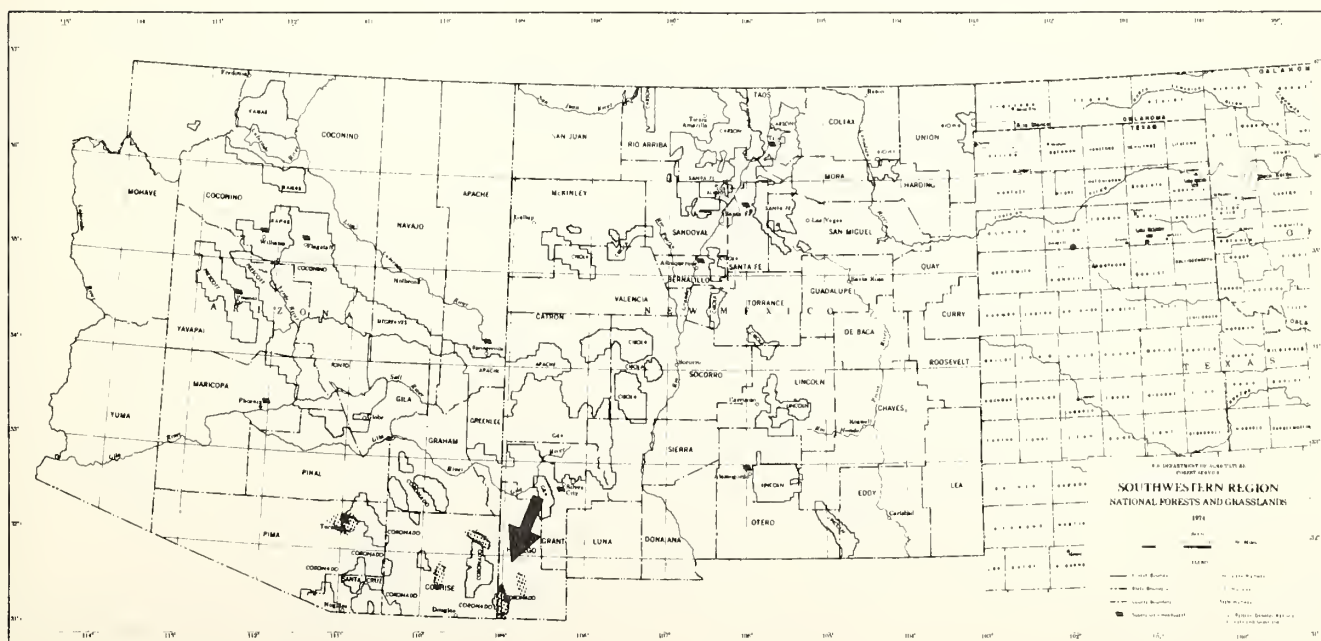
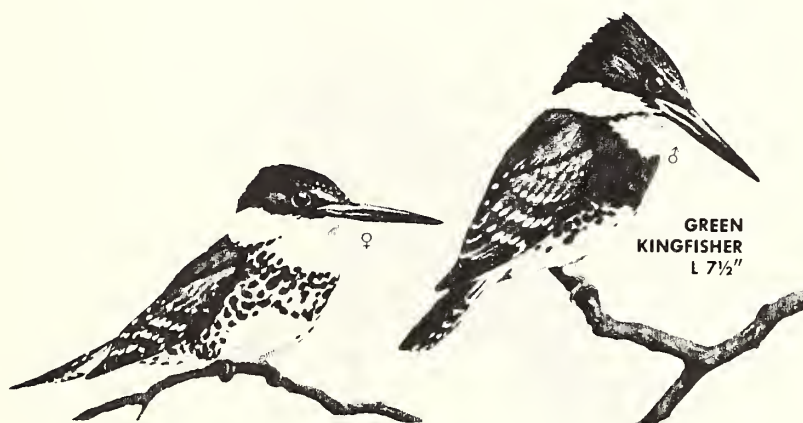
WHITE-EARED
HUMMINGBIRD
L 3"



RIPARIAN AND SEMI-RIPARIAN SPECIES:
GREEN KINGFISHER

Chloroceryle americana (Gmelin)

STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range.



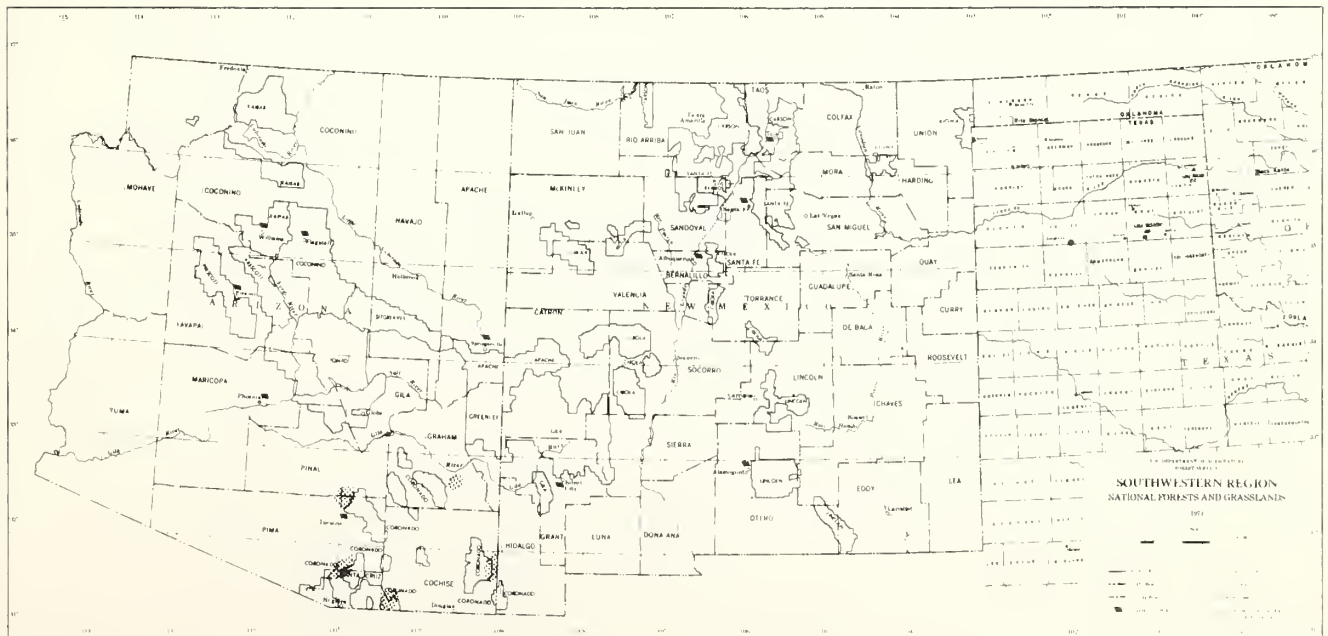
RIPARIAN AND SEMI-RIPARIAN SPECIES:
SULPHUR-BELLIED FLYCATCHER

Myiodynastes luteiventris (Sclater)

STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range. (Group I, New Mexico)



SULPHUR-
BELLIED
FLYCATCHER
L 6¾"

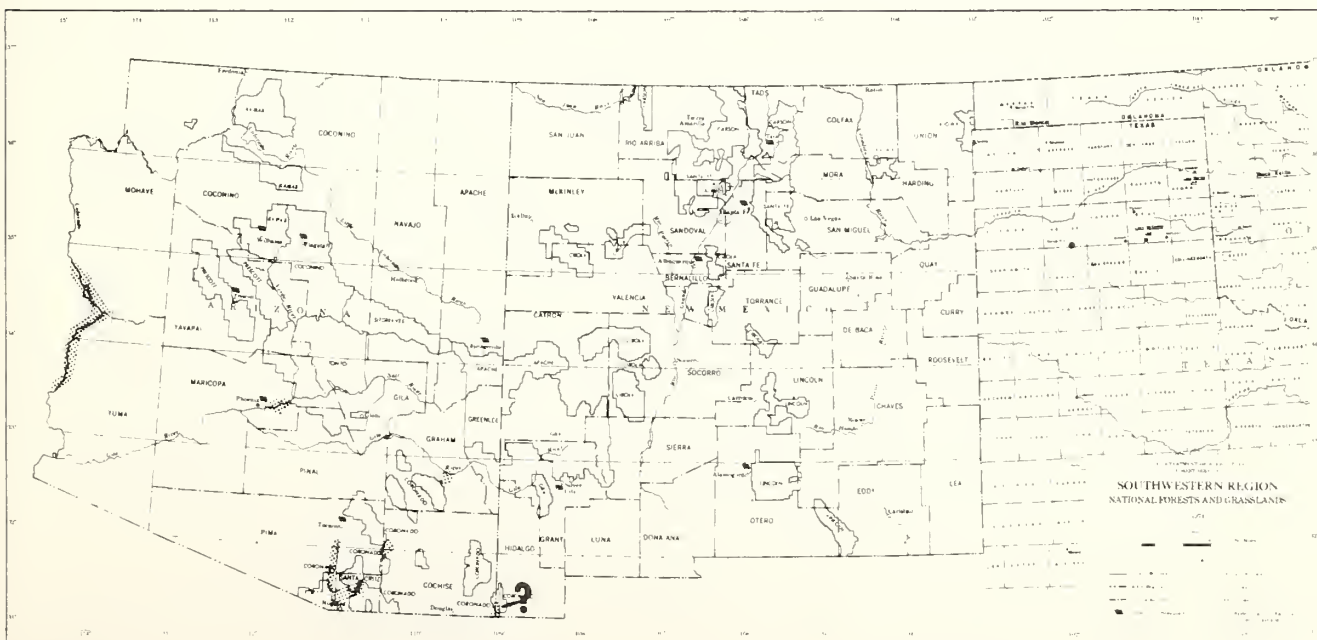


RIPARIAN AND SEMI-RIPARIAN SPECIES:
TROPICAL KINGBIRD

Tyrannus melancholicus (Vieillot)

STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range.

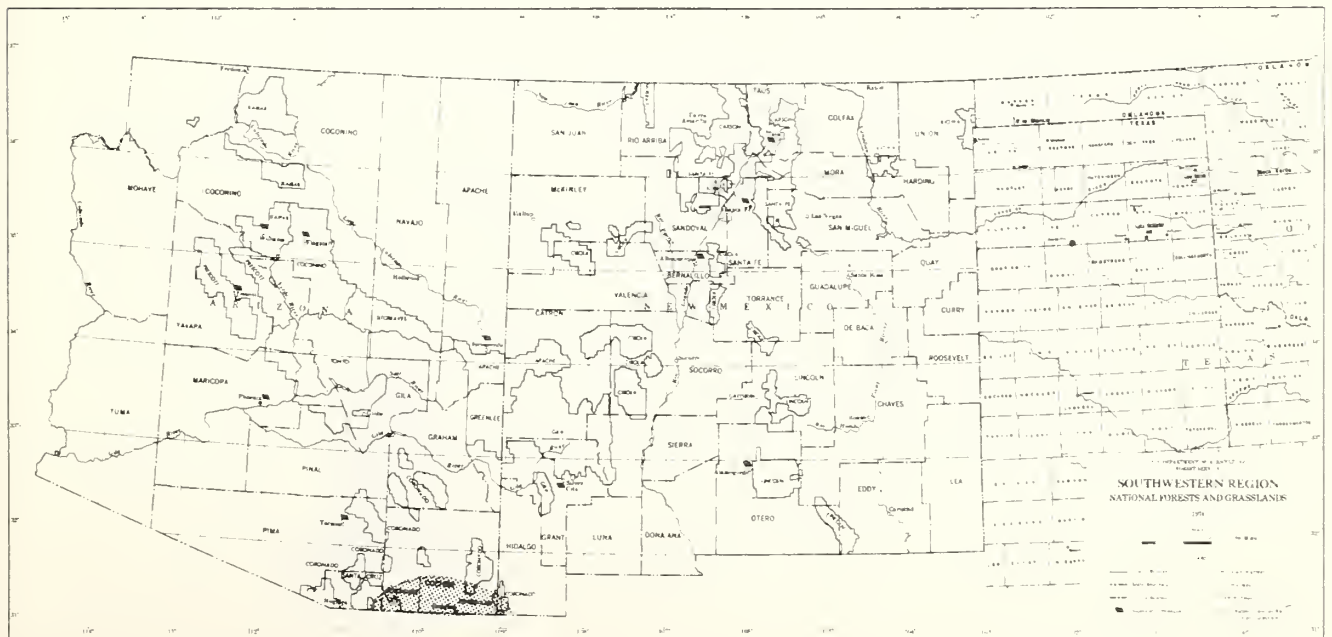
TROPICAL
KINGBIRD
L 7"



RIPARIAN AND SEMI-RIPARIAN SPECIES:
THICK-BILLED KINGBIRD

Tyrannis crassirostris (Swainson)

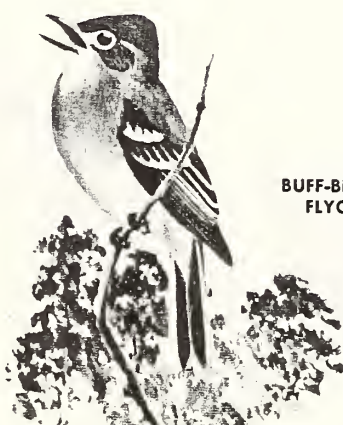
STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range. (Group II, New Mexico)



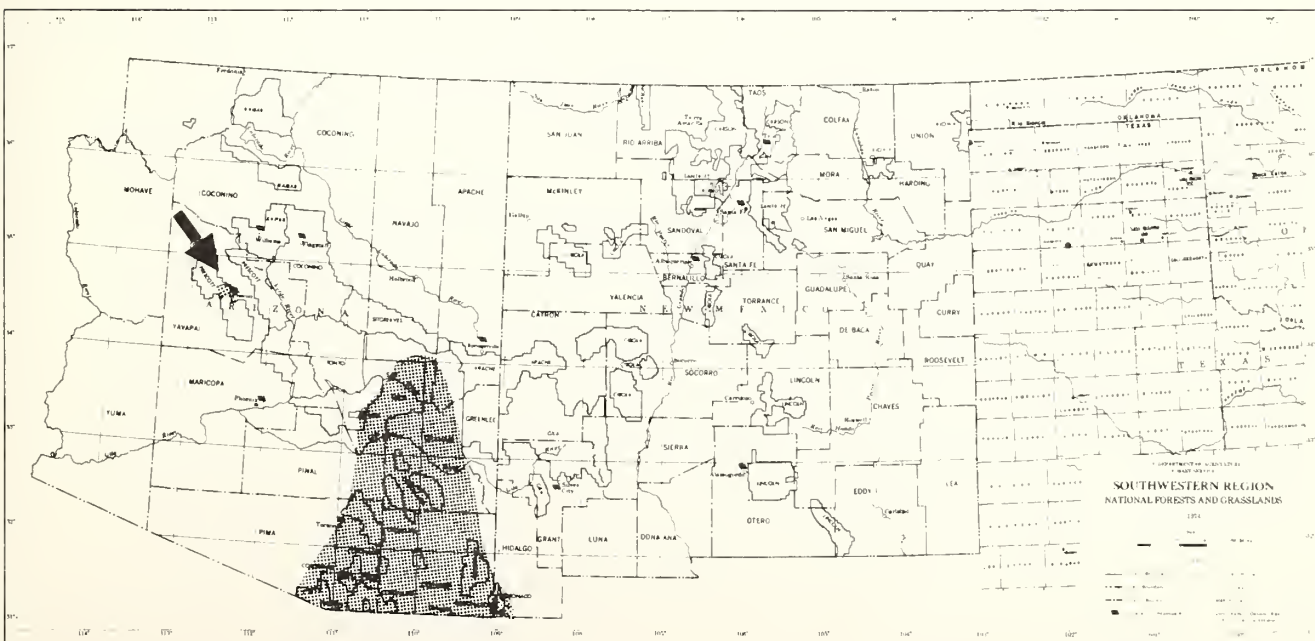
RIPARIAN AND SEMI-RIPARIAN SPECIES:
BUFF-BREASTED FLYCATCHER

Empidonax fulvifrons (Giraud)

STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range. (Group I, New Mexico)



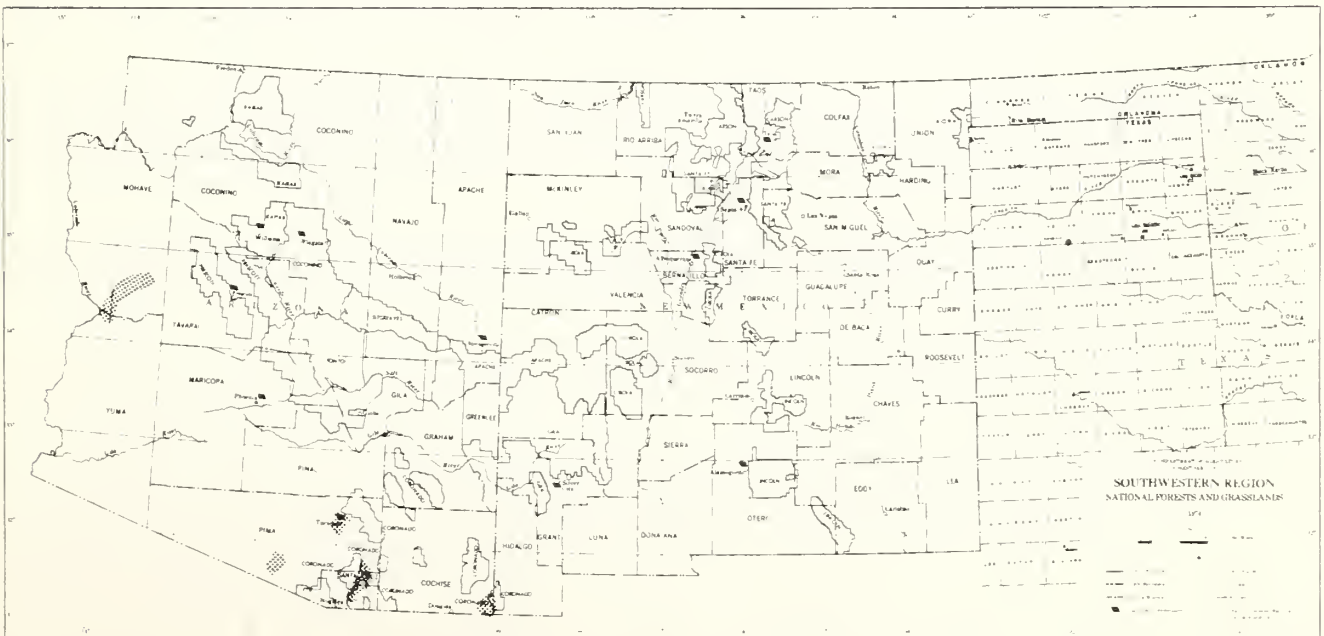
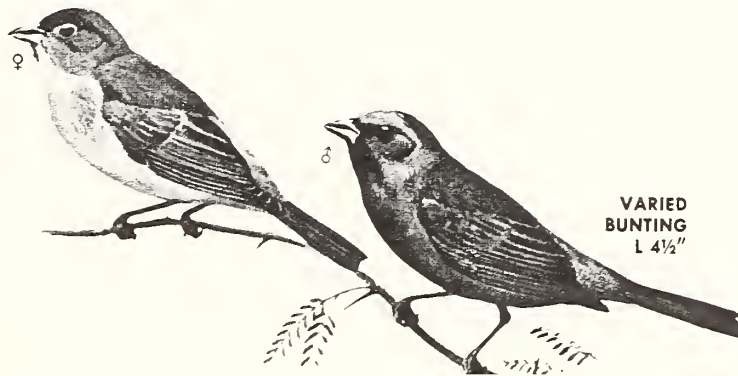
BUFF-BREASTED
FLYCATCHER
L 4"



RIPARIAN AND SEMI-RIPARIAN SPECIES:
VARIED BUNTING

Passerina versicolor (Bonaparte)

STATUS: Unique, and of particular interest as an uncommon visitor from south of the border, which nests and/or spends at least part of the year here at the northern limit of its range.



PINE-OAK WOODLAND SPECIES:

WHISKERED OWL (SPOTTED SCREECH OWL)
 *RIVOLI'S HUMMINGBIRD
 *WHITE-EARED HUMMINGBIRD
 *BUFF-BREASTED FLYCATCHER

Otus trichopsis (Wagler)
Eugenes fulgens (Swainson)
Hylocharis leucotis (Vieillot)
Empidonax fulvifrons (Giraud)

This small group of peripheral species share a common habitat requirement for the pine-oak woodland type of the Upper Sonoran Zone.

STATUS: All of the above species are unique, and of interest as regular visitors at the northern limit of their natural range.

REGIONAL DISTRIBUTION: These species are limited almost entirely to the Coronado National Forest. The buff-breasted flycatcher was formerly found as far north as Apache Creek, New Mexico near the north edge of the Gila National Forest, but has not been reported in that State since 1926. Rivoli's hummingbird may rarely get as far north as the Sierra Anchas in Arizona or possibly to the Carson or Santa Fe Forests in New Mexico, but that would be the exception rather than the rule.

HABITAT TYPE ASSOCIATION: The whiskered owl, a subspecies of the screech owl, breeds in the white oak woodland association, in canyon bottoms, at about the 6,000 foot level. The buff-breasted flycatcher tends to frequent the more open woodland areas at a somewhat higher elevation. However, it is quite versatile in its habitat requirements and may just as likely be found in the sycamore groves of the riparian areas. Rivoli's hummingbird is most likely to be found nesting along mountain streams, within the pine-oak cover type, although they tend to also range higher into the pine of the transition zone. The white-eared hummingbird, while not known to nest in this country, is a bird of the pine-oak woodland near mountain streams. Most observations of this species have been at feeding stations near human habitations.

DISTINGUISHING CHARACTERISTICS: Field identification of each of these species is best accomplished by consulting a good illustrated field guide. Field identification of the whiskered owl depends upon ability to recognize its distinctive call notes.

LIFE HISTORY DATA: Each individual species has its own particular life history. Consultation of good reference books is the best means of gaining knowledge of this data.

PROTECTIVE MEASURES ALREADY TAKEN: No specific measures have been taken beyond the protection provided by law.

*Although previously listed with the Riparian Species these birds prefer to nest along mountain streams of the Upper Sonoran Zone in the pine-oak woodland type. The White-breasted hummingbird has not been known to nest north of the Mexican border.

MANAGEMENT PROPOSALS:

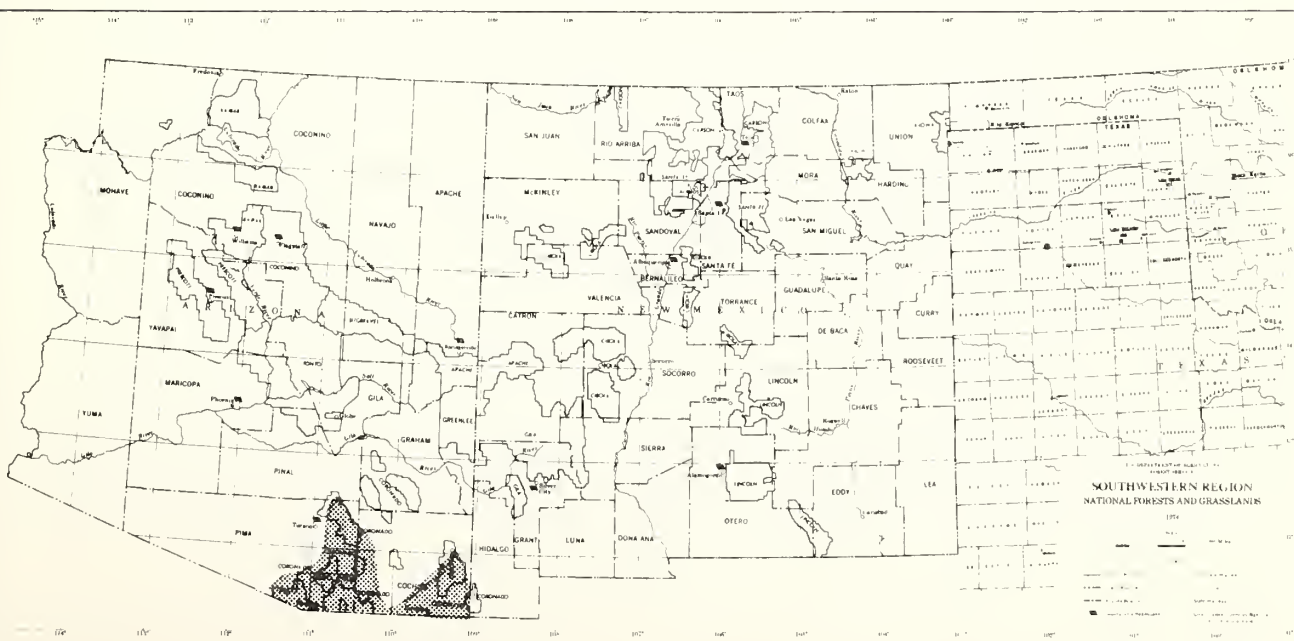
1. Be alert to the possible presence of these species and keep detailed notes on observations including date, place, habitat, number, sex and age (adult or immature). Nest records are of particular interest.
2. Give special consideration to habitat needs of these species in all forest functional plans and projects.
3. Consider the effects of logging, grazing and fire management on habitat modification and the resulting effect on bird life in all environmental analysis and statements.
4. Regulate the above management activities to perpetuate suitable areas of open pine-oak woodland with a full range of age classes near streams in the upper Sonoran and transition zones for bird nesting and feeding areas.
5. Regulate recreation use, and the expansion and development of camping and picnic areas to minimize disturbance of bird nesting areas.

NOTES

PINE-OAK WOODLAND SPECIES:
WHISKERED OWL (SPOTTED SCREECH OWL)

Otus trichopsis (Wagler)

STATUS: Unique, and of interest as a regular visitor at the northern limit of its natural range.



GRASSLAND, GRASSLAND-BRUSH, AND SEMI-DESERT GRASSLAND-BRUSH SPECIES.

*ELF OWL	<u>Micrathene whitneyi</u> (Cooper)
*FERRUGINOUS OWL	<u>Glaucidium brasilianum</u> (Gmelin)
*VARIED BUNTING	<u>Passerina versicolor</u> (Bonaparte)
GRASSHOPPER SPARROW	<u>Ammodramus savannarum</u> (Gmelin)
RUFIOUS-WINGED SPARROW	<u>Aimophila carpalis</u> (Coues)
BOTTERI'S SPARROW	<u>Aimophila botterii</u> (Sclater)

The above species are grouped because of more or less similar habitat requirements, and because they are all considered to be peripheral species in the Region, breeding near the northern limit of their natural range.

STATUS: All of these species are unique, and of special interest because they are seen and recognized only very infrequently here.

REGIONAL DISTRIBUTION: These species are limited almost exclusively to the vicinity of the Coronado National Forest in Arizona, but the varied bunting may be found on the Guadalupe Ranger District of the Lincoln National Forest, and the grasshopper sparrow may rarely get as far north as the Santa Fe National Forest or Grassland portion of the Cibola National Forest. The ferruginous owl ranges as far north as Saguaro lake on the Tonto National Forest in Arizona.

HABITAT TYPE ASSOCIATION: The owls are frequently associated with nesting sites which consist of old woodpecker holes in saguaro cactus. Woodpecker holes in trees, especially sycamore trees are also used, being especially favored by elf owls. Dense grassland with mixed low brush is favored by the sparrows, while the more brushy microphyll or chaparral is preferred by the varied bunting.

*The owls and varied bunting are also listed with the riparian species. The bunting tends to nest in streamside thickets of mesquite or chaparral, but may most frequently be seen among the saguaros in the semi-desert shrub type.

DISTINGUISHING CHARACTERISTICS: Both owls are small, round headed owls, without ear-like tufts of feathers. Both tend to be primarily nocturnal, and can best be observed at night by calling. The elf owl is no larger than a medium sized sparrow and the Ferruginous owl only slightly larger. The grass dwelling sparrows tend to be quite secretive, spending most of their time on the ground or near it in the low bushes. These characteristics make these species quite difficult to recognize by field marks. Therefore they are most easily found and recognized by their songs. The grasshopper sparrow's buzzing trill is said to closely resemble the buzzing of an insect, and is the basis for its common name. The Botteri's sparrow is recognized in the field almost exclusively by its song. Only the rufous-winged sparrow is recognized in the field by its distinctive head markings, consisting of a rufous patch on the shoulder for which it is named (cannot be seen readily in the field). Pictures in the bird books notwithstanding the male varied bunting looks like a small black finch unless seen at very close range and the flash of red or blue on the nape or crown is not always seen. Further details of distinguishing markings and characteristics should be obtained by consulting field guides.

REPRODUCTION: This information varies considerably from species to species and can be obtained as needed by referring to such authorities as Bent's Life Histories.

PROTECTIVE MEASURES ALREADY TAKEN: None beyond protection provided by law.

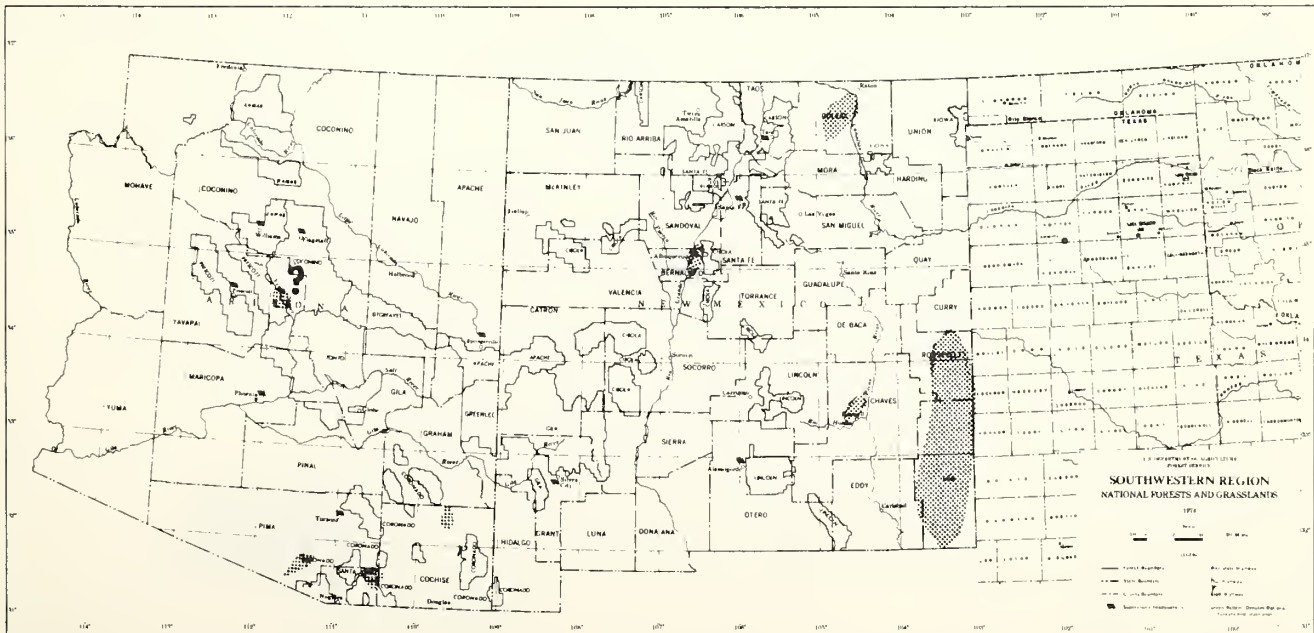
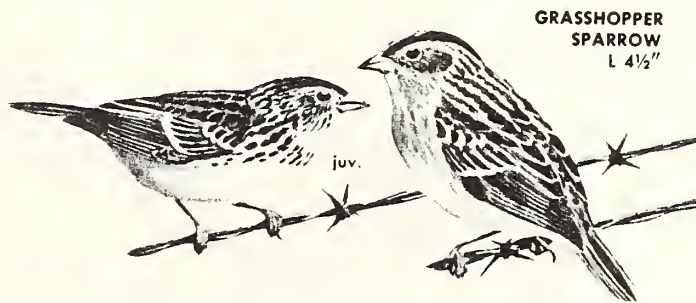
MANAGEMENT PROPOSALS:

1. Be alert to the possible presence of these species and record observation such as date, time and place seen, type of habitat being used, number and age of individuals (adult or immature). Nesting records with details are particularly important.
2. In all Forest functional plans and project proposals give special consideration to habitat protection needs.
3. Regulate grazing use and fire management activities to favor perpetuation of dense grass stands and prohibit excessive spread of brush species.
4. Consider the needs of grassland and grassland-brush species in all environmental analyses and statements.
5. Time cover manipulation activities so as not to conflict with nesting period of bird species inhabiting the area.
6. Provide for retention of dead trees and saguaro's with woodpecker holes suitable for nesting sites.

GRASSLAND, GRASSLAND-BRUSH, AND SEMI-DESERT GRASSLAND-BRUSH SPECIES.
GRASSHOPPER SPARROW

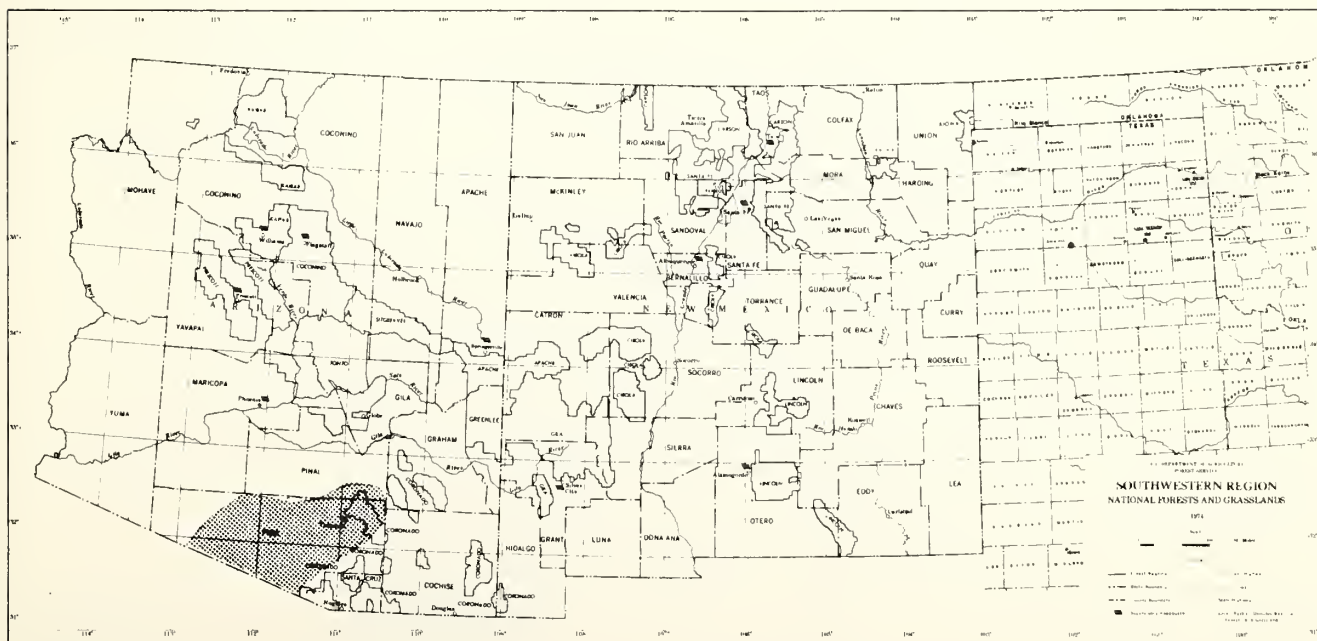
Ammodramus savannarum (Gmelin)

STATUS: Unique, and of special interest because they are seen and recognized only very infrequently here.



GRASSLAND, GRASSLAND-BRUSH, AND SEMI-DESERT GRASSLAND-BRUSH SPECIES.
 RUFIOUS-WINGED SPARROW *Aimophila carpalis* (Coues)

STATUS: Unique, and of special interest because they are seen and recognized only very infrequently here.



GRASSLAND, GRASSLAND-BRUSH, AND SEMI-DESERT GRASSLAND-BRUSH SPECIES.

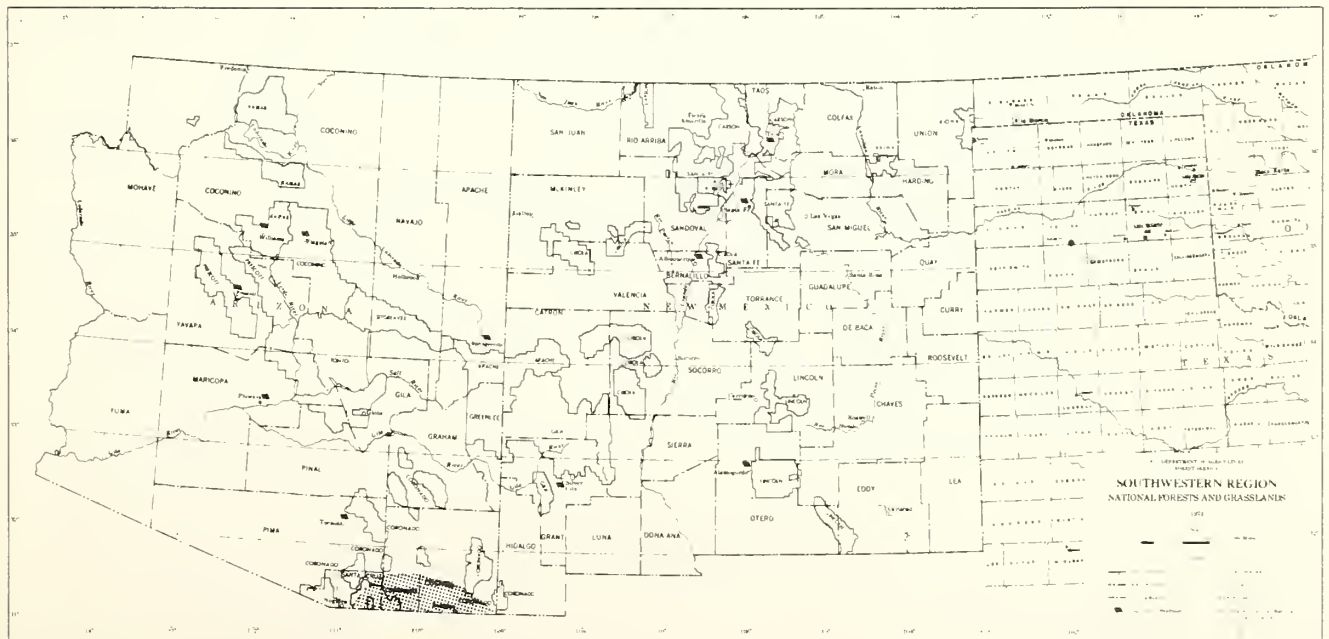
BOTTERI'S SPARROW

Aimophila botterii (Scalder)

STATUS: Unique, and of special interest because they are seen and recognized only very infrequently here.



BOTTERI'S
SPARROW
L 5½"



ADDITIONAL ENDANGERED AND UNIQUE SPECIES

The unique species in this section are of special interest because:

1. They are peripheral species occurring in this Region at the extreme limit of their range;
2. They are inhabitants of very limited ranges which occur wholly or partially within this region; or
3. They are species which occur in very limited numbers over a broad range but are seen so infrequently as to raise some question as to their survival status. Detailed notes of any field observations of these species should be kept and recorded on blank side of the page for the species.

These notes should include the name of the species, date, and place seen, type of habitat being used, number, sex, and age of individuals if it can be determined, whether adults are engaged in rearing or feeding young, type of food being consumed, and any other such pertinent data.

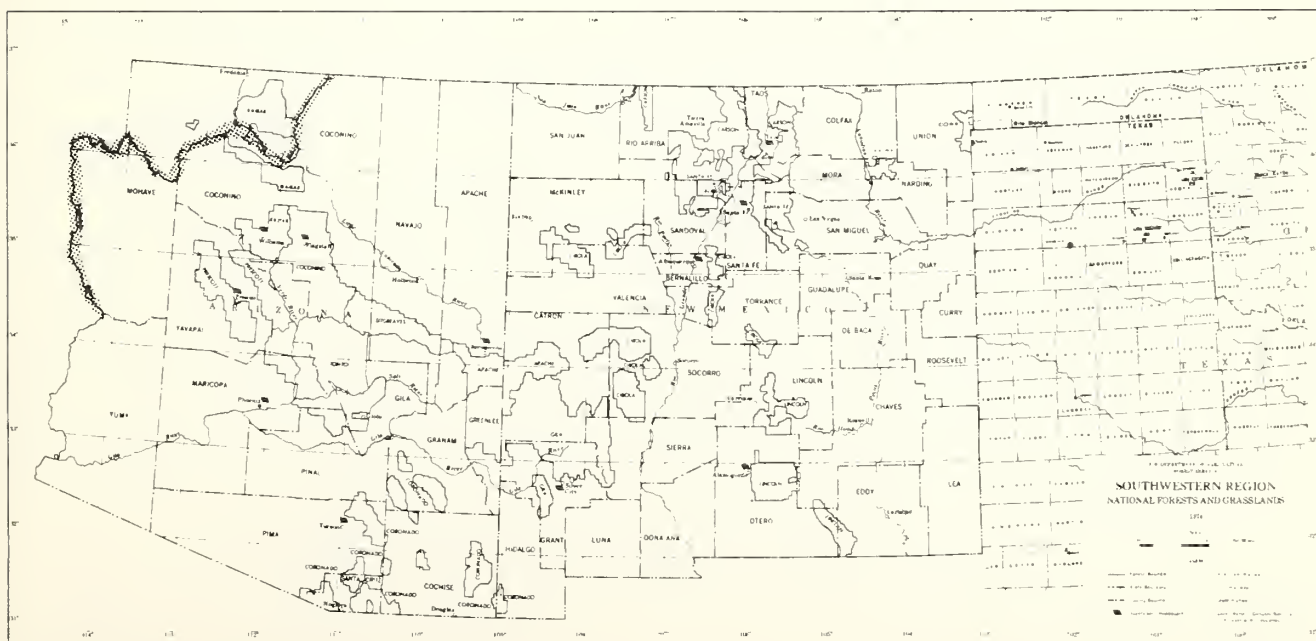
It is important that we be aware of the possible, but in many cases, irregular appearance of these animals and of their habitat requirements. These needs should be taken into consideration in all management plans and project proposals, but may not merit as high priority as those endangered or unique species which are covered in more detail. By being aware of the unique as well as the endangered species and providing for their needs in habitat management, we can encourage the perpetuation of their occurrence at the limits of their range, or within an already severely limited range, perhaps even enhance their expansion. In this way, we may be able to help prevent these animals from joining the ranks of an already too large list of "threatened and endangered" or extinct species.

FISH
 BONYTAIL CHUB
 Bonytail Chub, Gila Trout (a misnomer)

Gila elegans (Baird and Girard)

STATUS: Unique

A large minnow, lacking maxillary barbels, may reach a length of one foot or more. A large river fish of the Salt and Verde etc., now thought to be restricted to the main channel of the Colorado River. Most common near heads of pools and large turbulent eddies.



COLORADO RIVER CHUB (ROUNDTAIL CHUB)

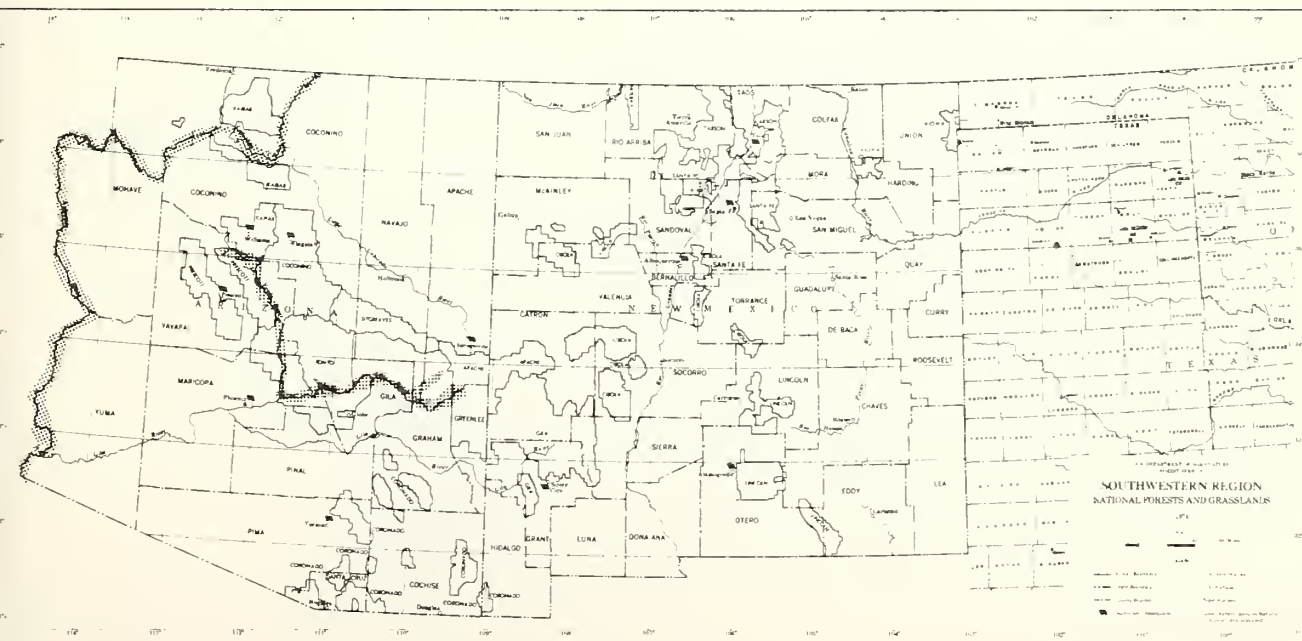
Gila robusta (Baird and Girard)

Colorado River Chub, Verde trout, River Trout, Gila Trout (misnomer).

STATUS: Unique, (Group II, New Mexico)

Three subspecies occur in Arizona waters. Generally in the mainstream of large rivers or in large tributaries. These local races all of special interest due to their variability.

A large minnow with fine scales, slender body and sickle-shaped fins. Many reach a length of 20 inches and weight of 1 1/2 pounds. Common to Verde and Salt River drainages but in decreasing numbers. Is also found in limited numbers in the mainstream Colorado.

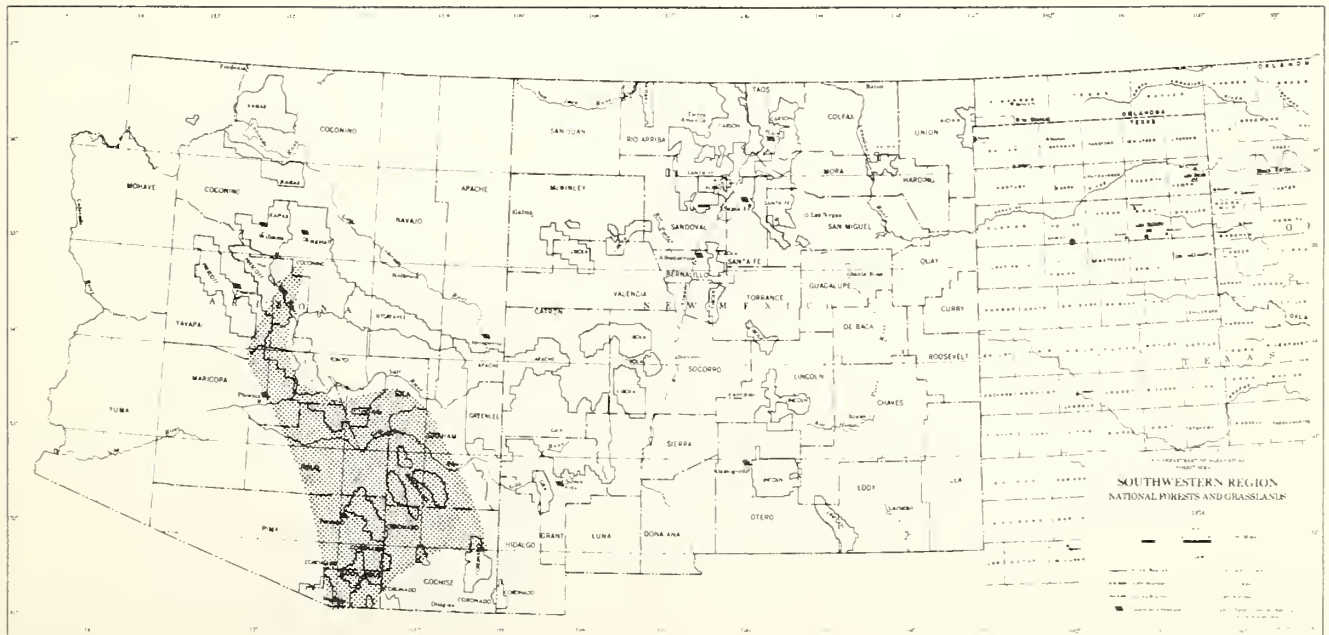


FISH

GILA CHUB, Small fin Colorado Chub.

Gila intermedia (Girard)STATUS: Unique

A medium-sized minnow, seldom over six inches long, and lacking maxillary barbels. Apparently restricted to the Gila River System in southern Arizona. Most abundant in pools of small creeks, in springs, and in swampy areas. The fish also does well in some pools within irrigation systems.

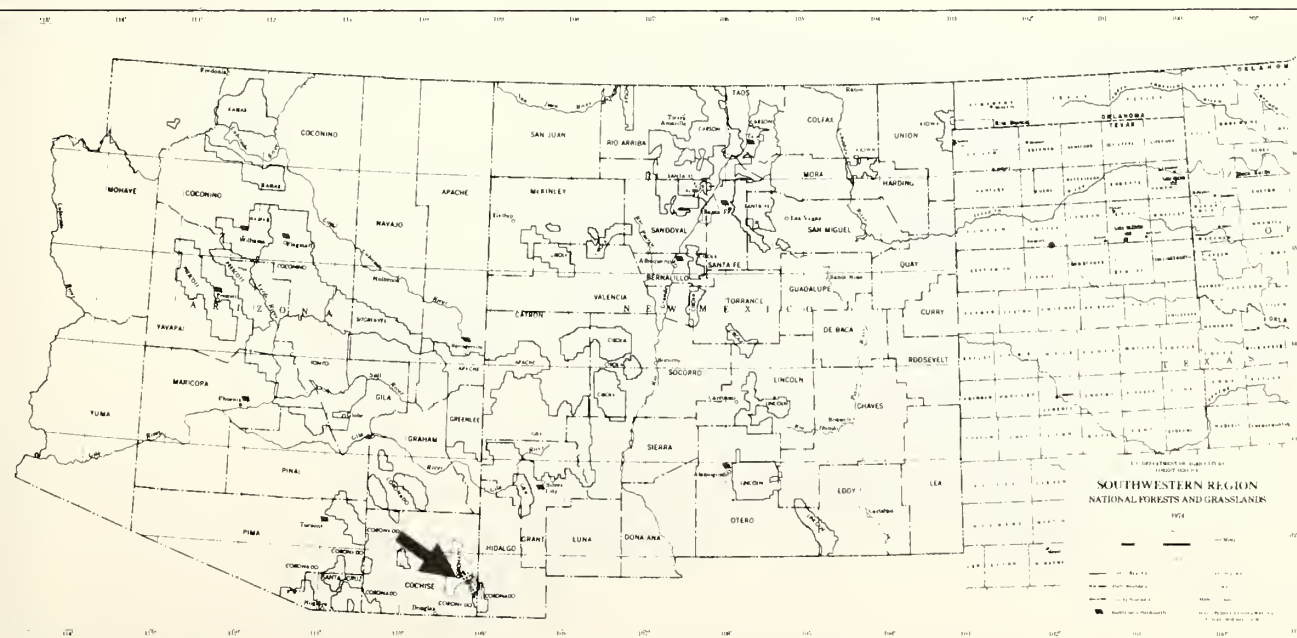


FISH
YAQUI CHUB

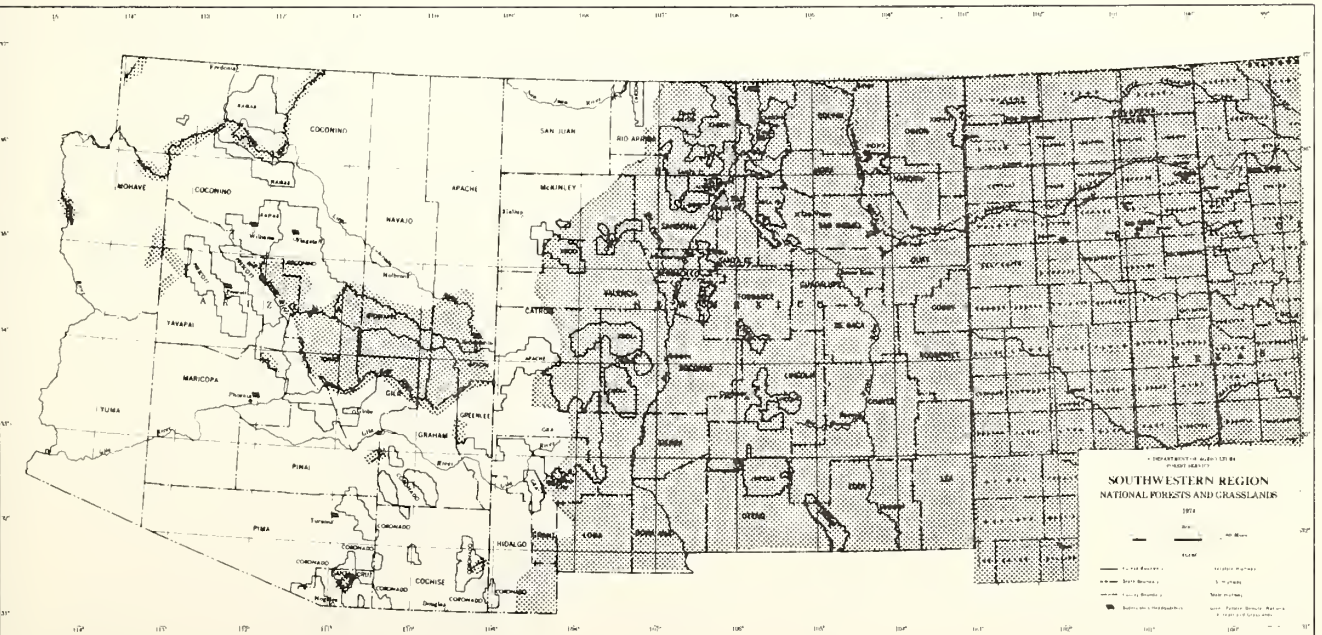
Gila purpurea (Girard)

STATUS: Unique

A medium-sized minnow, seldom more than seven inches long. A triangle shaped dark spot occurs at the base of the tail. Found in the United States only in the extreme headwaters of the Rio Yaqui on the San Bernardino Ranch and in Leslie Creek. Formerly present in streams flowing into Wilcox plaza from the Coronado National Forest. May still exist in these streams.



STATUS: Unique

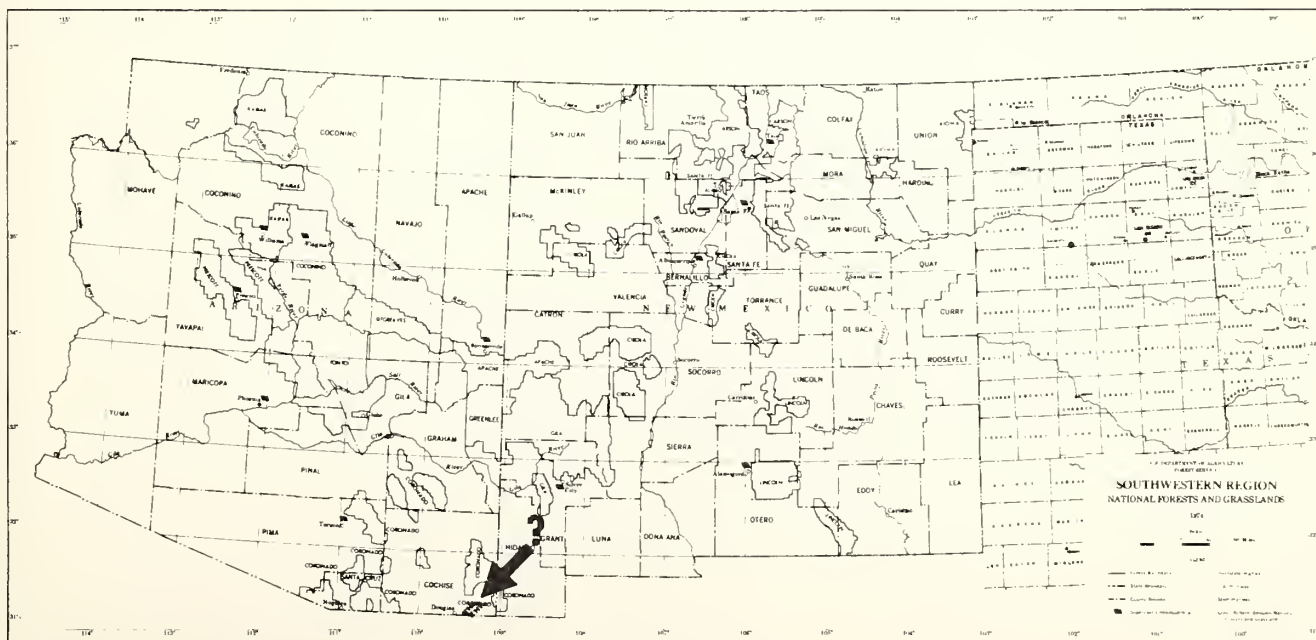
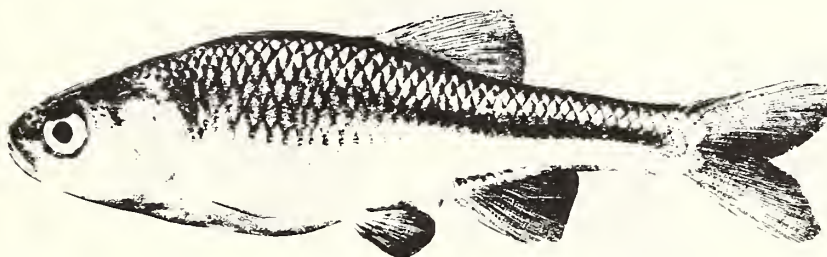


FISH
YAQUI SHINER

Notropis formosus mearnsi (Snyder)

STATUS: Unique

A small, deep-bodied minnow, peripheral from Mexico. Formerly found on the San Bernardino Ranch at the headwaters of the Rio Yaqui and also in the Mimbres drainage, Gila National Forest (as a different subspecies). Now thought to be extinct in the United States.

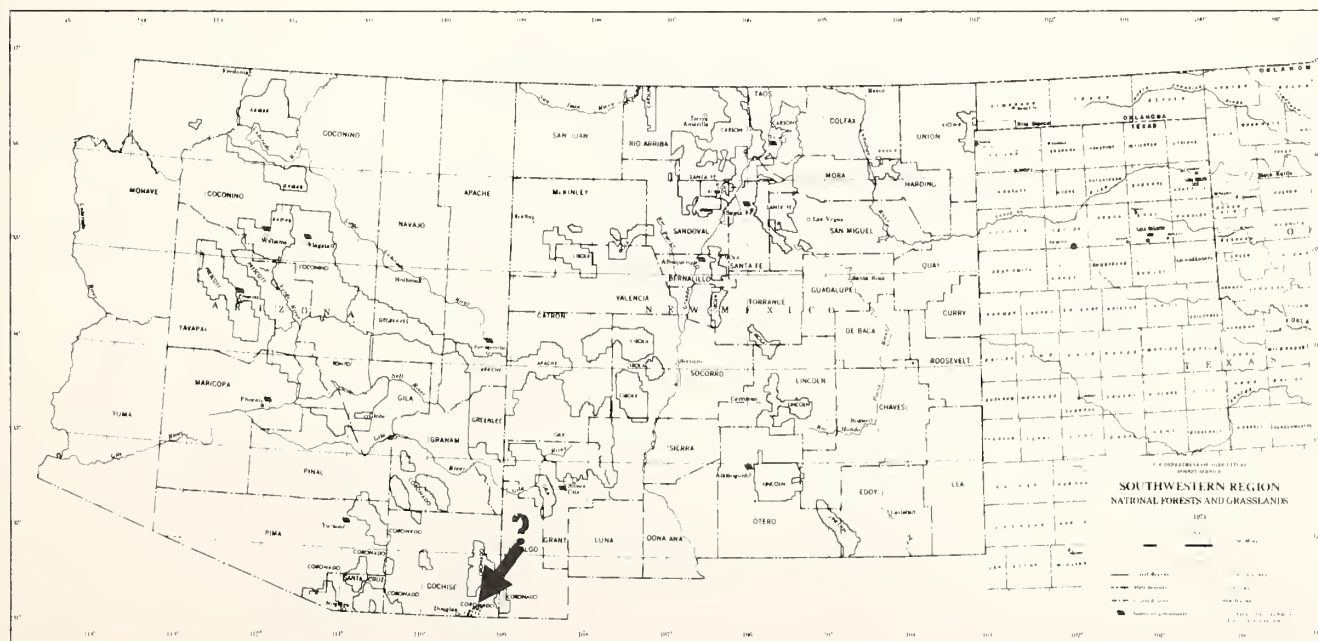
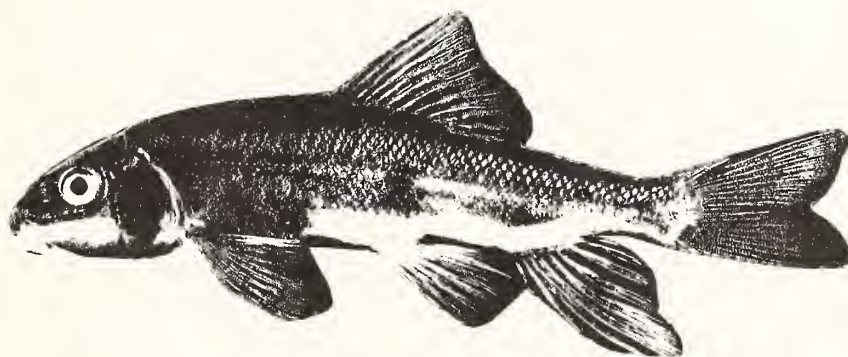


FISH
YAQUI SUCKER

Catostomus bernardini (Girard)

STATUS: Unique

A peripheral species with sucking mouth parts, formerly found on the San Bernardino Ranch at the headwaters of the Rio Yaqui. Now thought to be extinct in the United States. Could be reintroduced from Mexico.



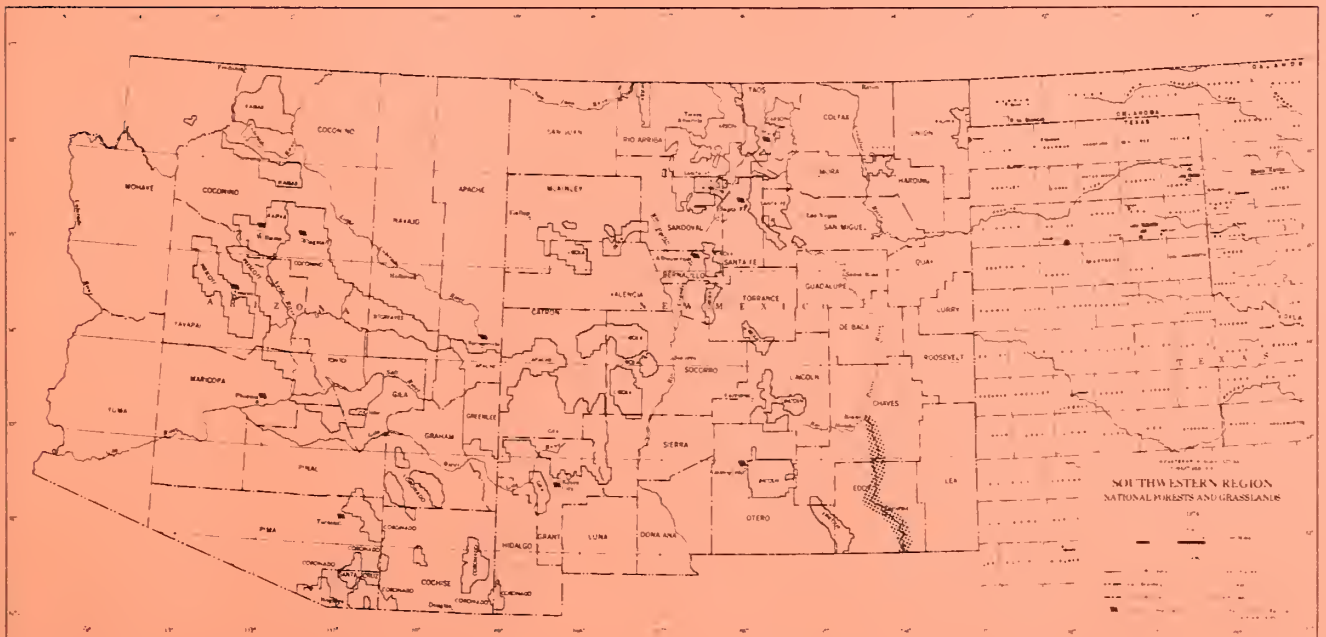
FISH
PECOS GAMBUSIA

Gambusia nobilis (Baird and Girard)

STATUS: ENDANGERED, (Group I, New Mexico)

A small, live-bearing species of fish, with a rounded caudal fin. The female, which is larger than the male has a maximum length of 1.6 inches. It inhabits 4 or 6 springs, tributary to the Pecos River, Texas and New Mexico. These springs are high in carbonates with temperature range of 69° to 79° F. Included here since some National Forest springs might be suitable habitat for introduction of the species.

The Pecos gambusia is very similar in appearance to other gambusia and poeciliopsis. There is no photo of the Pecos gambusia available at this time.



FISH
YAQUI TOP MINNOW

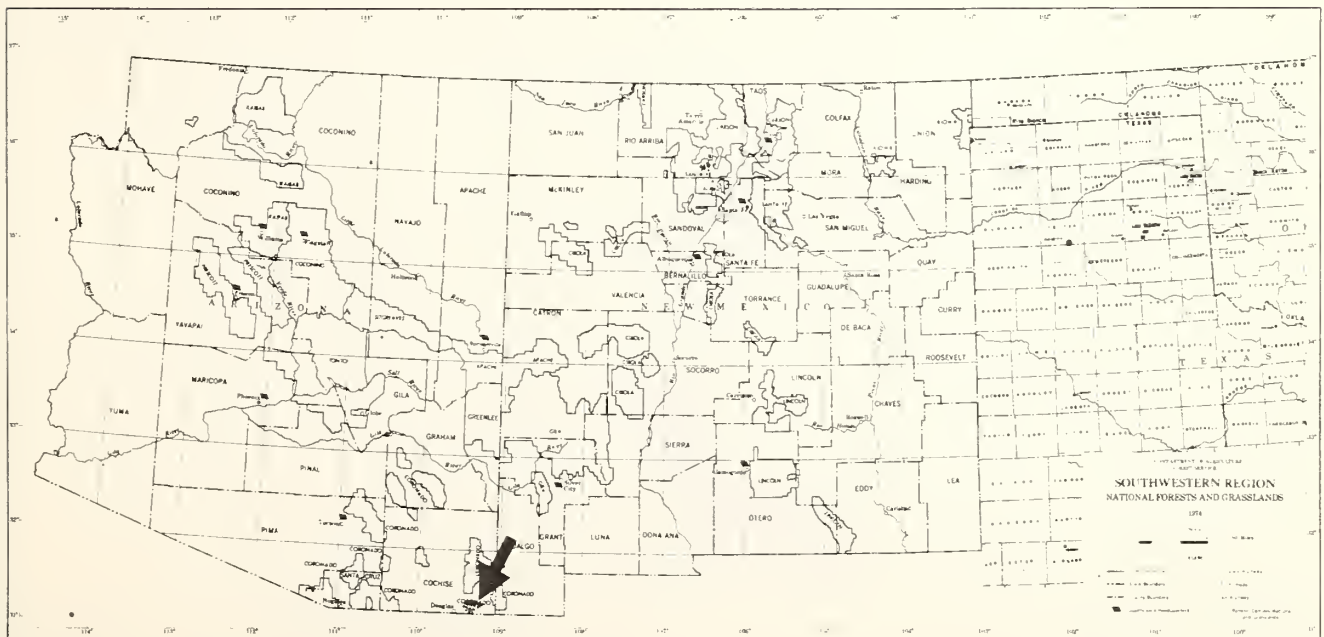
Poeciliopsis occidentalis sonoriensis

STATUS: Endangered

A topminnow found in the United States only on the San Bernardino ranch and in Leslie Creek in the headwater basin of the Rio Yaqui. Has been fairly abundant within this limited range. Pumping within the past 3 years has caused a decrease of discharge in natural springs and artesian bores and many populations have been lost. As a matter of interest many of the bores were drilled in the early 1900's by Texas John Slaughter.



Male above, female below



TEXAS BANDED GECKO

Coleonyx brevis

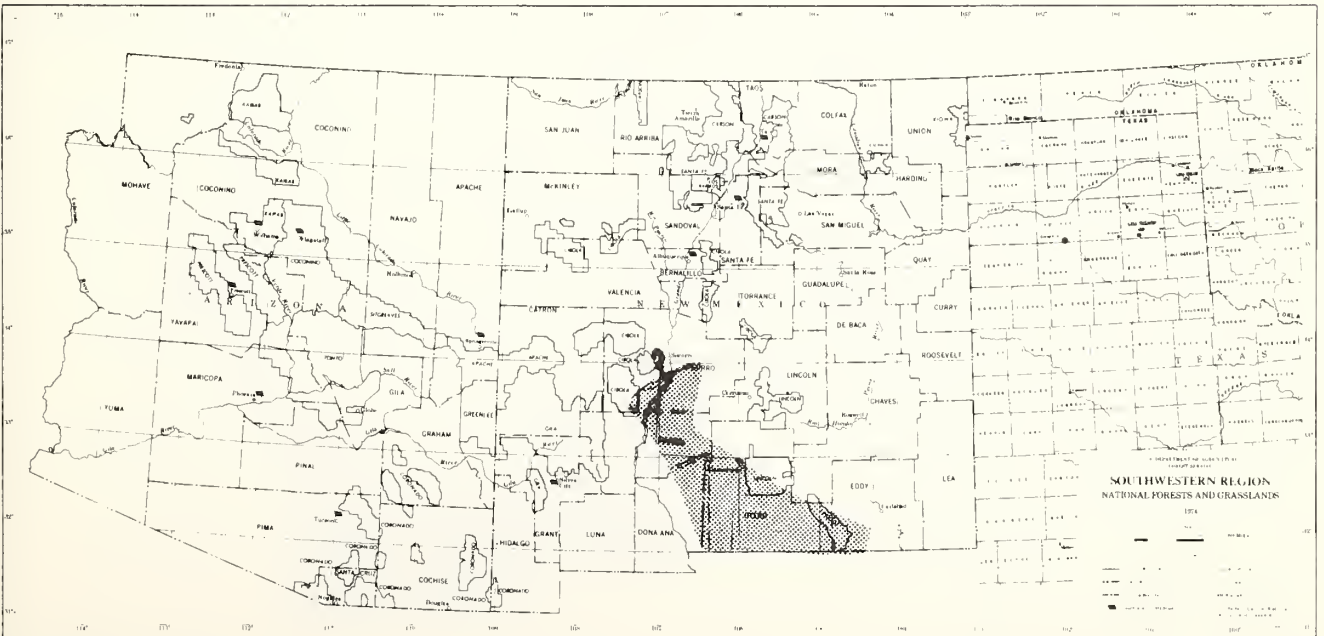
STATUS: Unique

A small brown and cream banded lizard with vertical eye pupils. Found in canyons and around rock outcrops in the Guadalupe District and possibly the Sacramento Mountains on the Lincoln National Forest.



BANDED GECKO

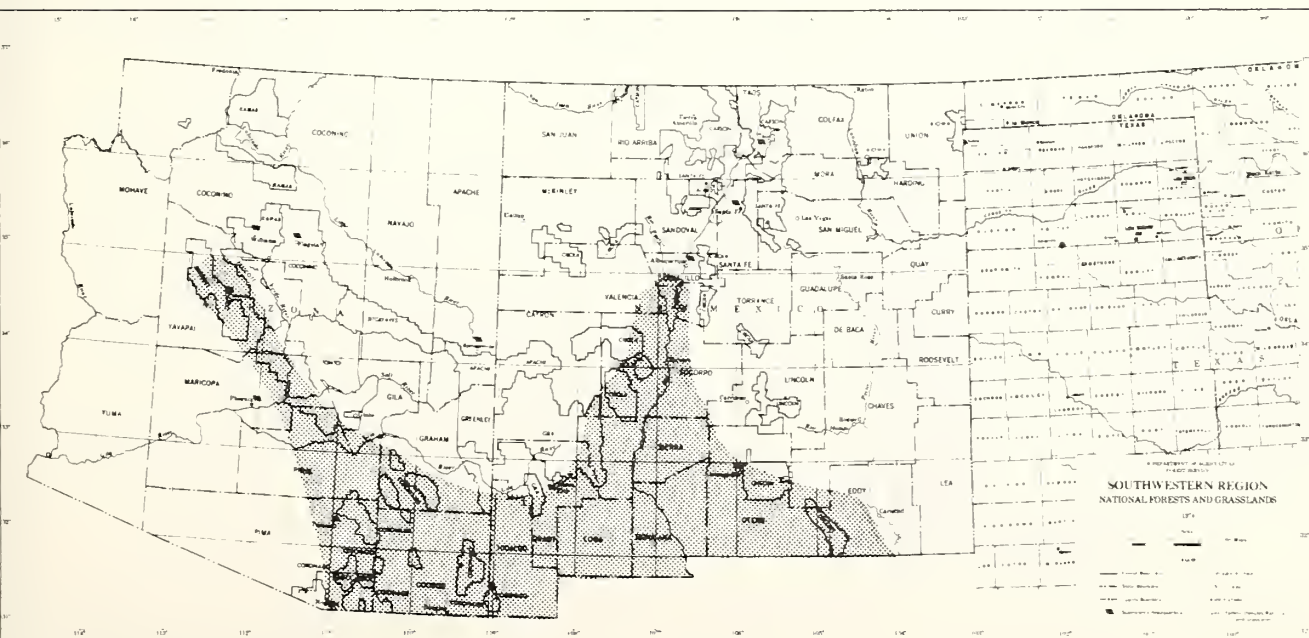
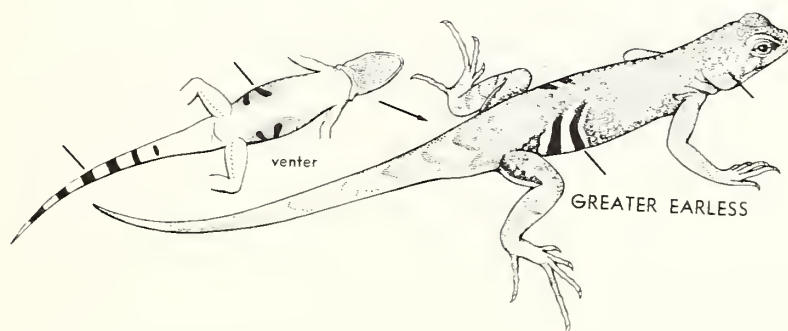
In the absence of a photo for this subspecies, the banded gecko whose appearance is nearly identical is shown.



GREATER EARLESS LIZARD

Holbrookia texanaSTATUS: Unique

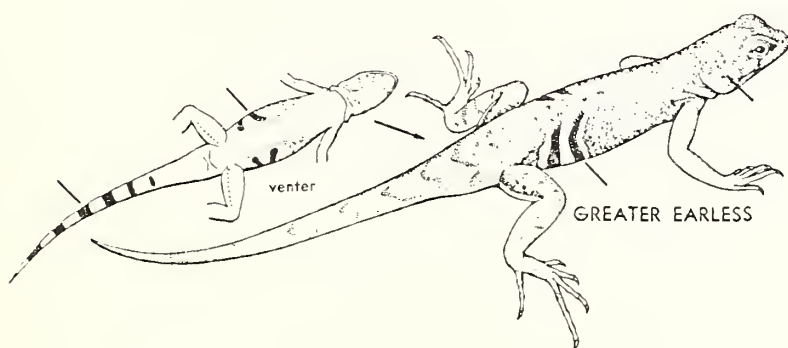
A small, flat-tailed, slim-legged lizard, identified by black cross bars on the underside of the tail and on sides in front of hind legs. Found in the microphyll cover type at middle elevations. Resident of central Arizona, New Mexico, and North Texas.



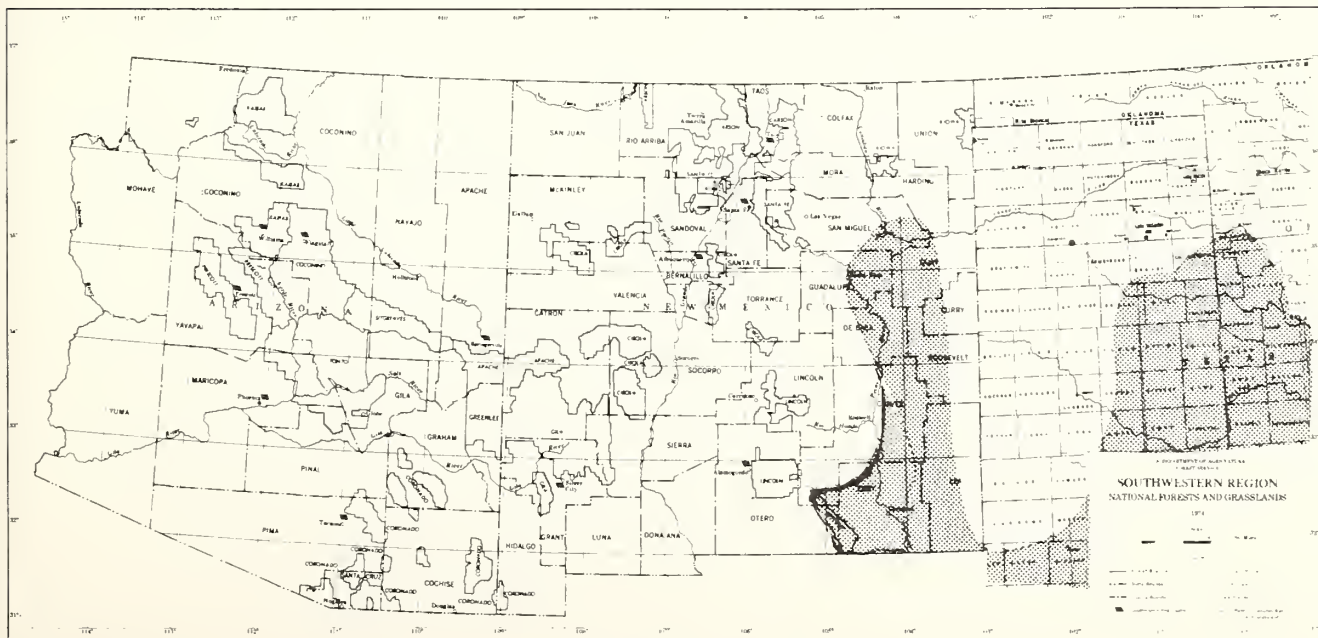
TEXAS EARLESS LIZARD

Holbrookia t. texanaSTATUS: Unique

Similar to previous species but without orange and yellow spots on back or dark spots along vertebrae. Found only on the Lincoln (Guadalupe Mountains) and possibly the Santa Fe National Forests. Prefers dry, sandy or gravelly flats, and washes or intermittent stream bottoms. May occasionally be found on rocky hillsides.



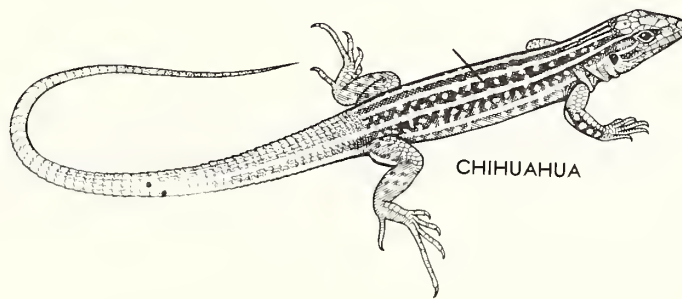
In the absence of a photo for this subspecies, the greater earless lizard whose appearance is nearly identical is shown.



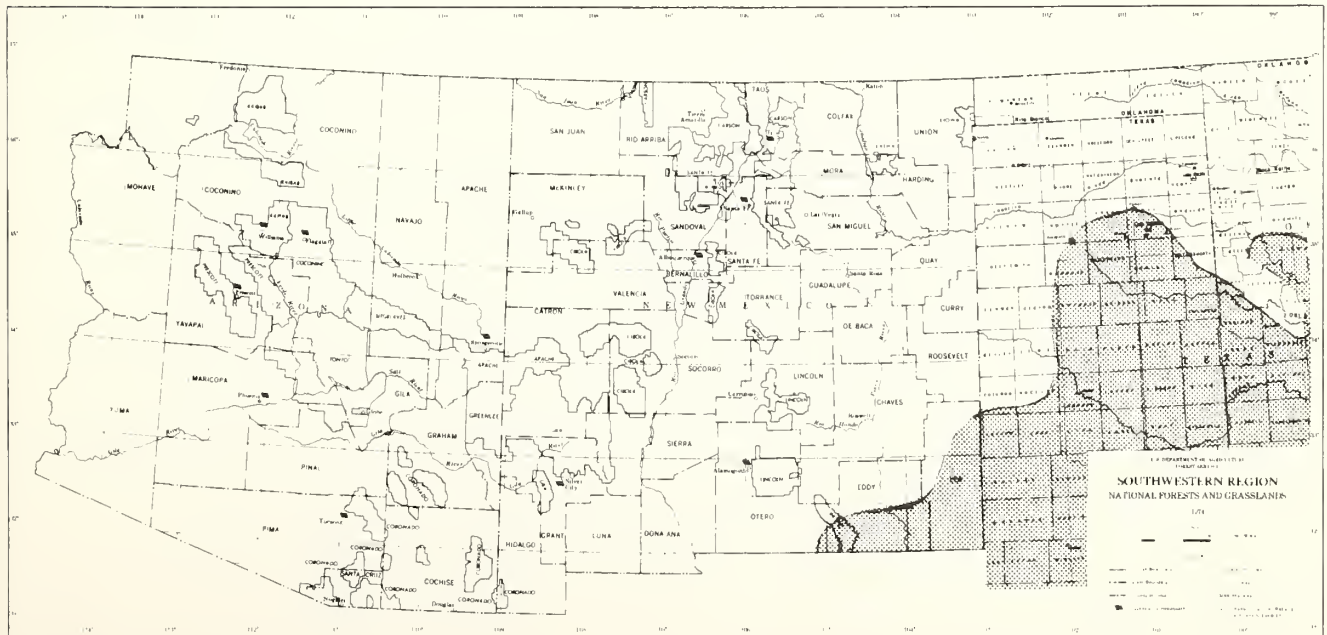
TEXAS SPOTTED WHIPTAIL

Cnemidophorus gularisSTATUS: Unique

A small lizard, 4 to 8 inches in total length, with eight longitudinal stripes with yellow brown spots between. Males have a dark blue or blackish chest and salmon colored throat. Frequents river bottoms and washes, mesquite, cactus, acacia and brush. Thought to be limited to the south end of the Guadalupe Division of the Lincoln National Forest.



In the absence of a photo for this subspecies, the chihuahua whiptail whose appearance is nearly identical is shown.



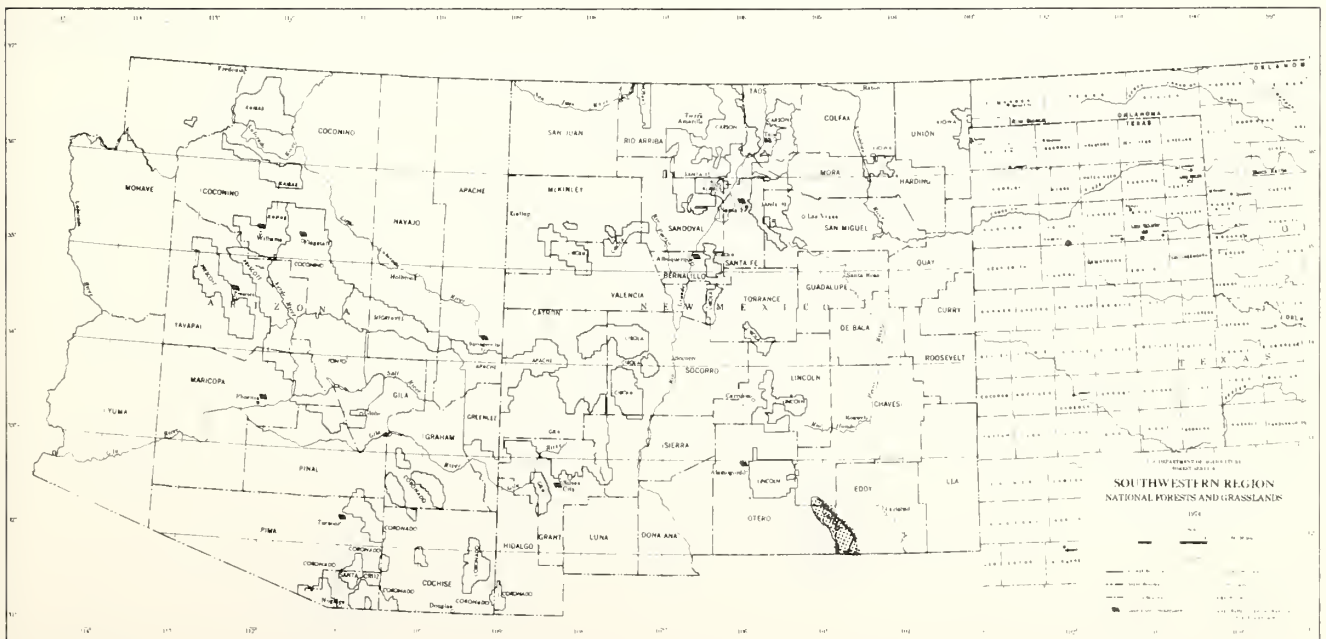
TRANS-PECOS RAT SNAKE

Elaphe subocularisSTATUS: Unique

A slender bodied, light colored snake with "H" shaped dark brown or black marks on back and large, round eyes. Found in the lower desert areas up to about 5,000 feet in association with ocotillo, agave, creosote bush, yucca, mesquite, and cactus. Thought to be found within the National Forests only on the Gualupe Division.



TRANS-PECOS RAT



MOTTLED ROCK RATTLESNAKE

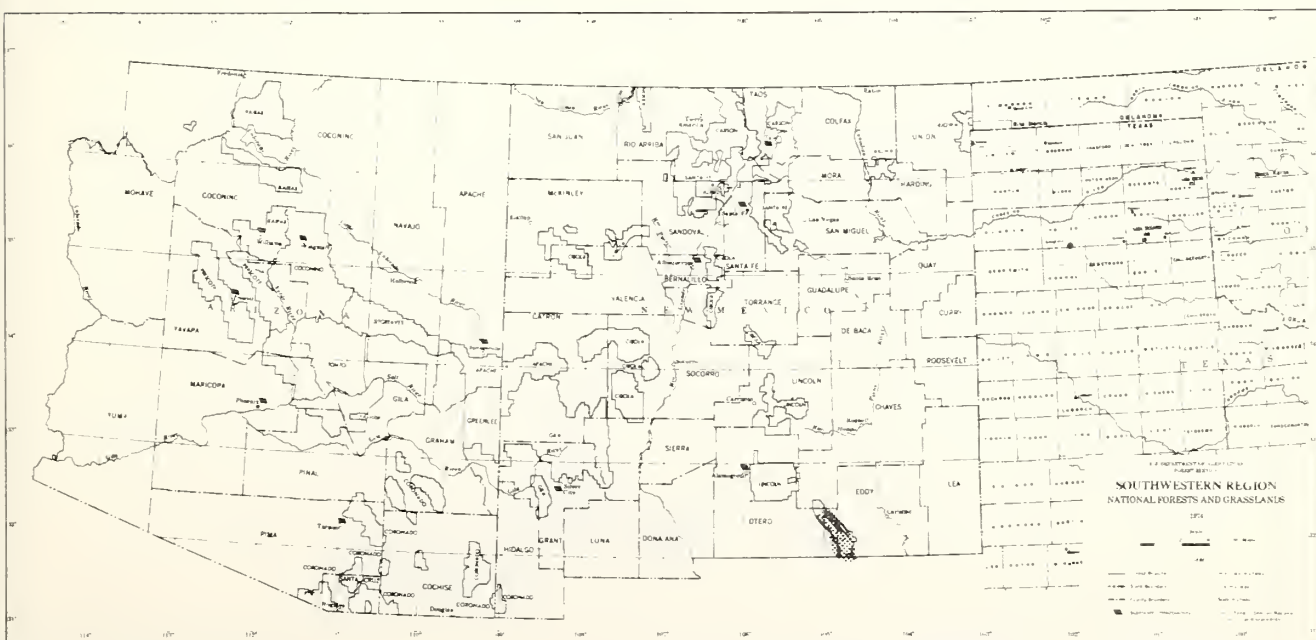
Crotalus lepidus lepidusSTATUS: Unique, (Group II, New Mexico)

A small (15 to 30 inches) dusky colored rattlesnake with widely spaced dark bands, and much spotting between bands. Found basking among rocks on ridges or in open areas in pine and woodland types. Known in this area only from the Gualupe Mountains on the Lincoln National Forest.



ROCK RATTLESNAKE

In the absence of a photo for this subspecies, the rock rattlesnake whose appearance is nearly identical is shown.



BANDED ROCK RATTLESNAKE

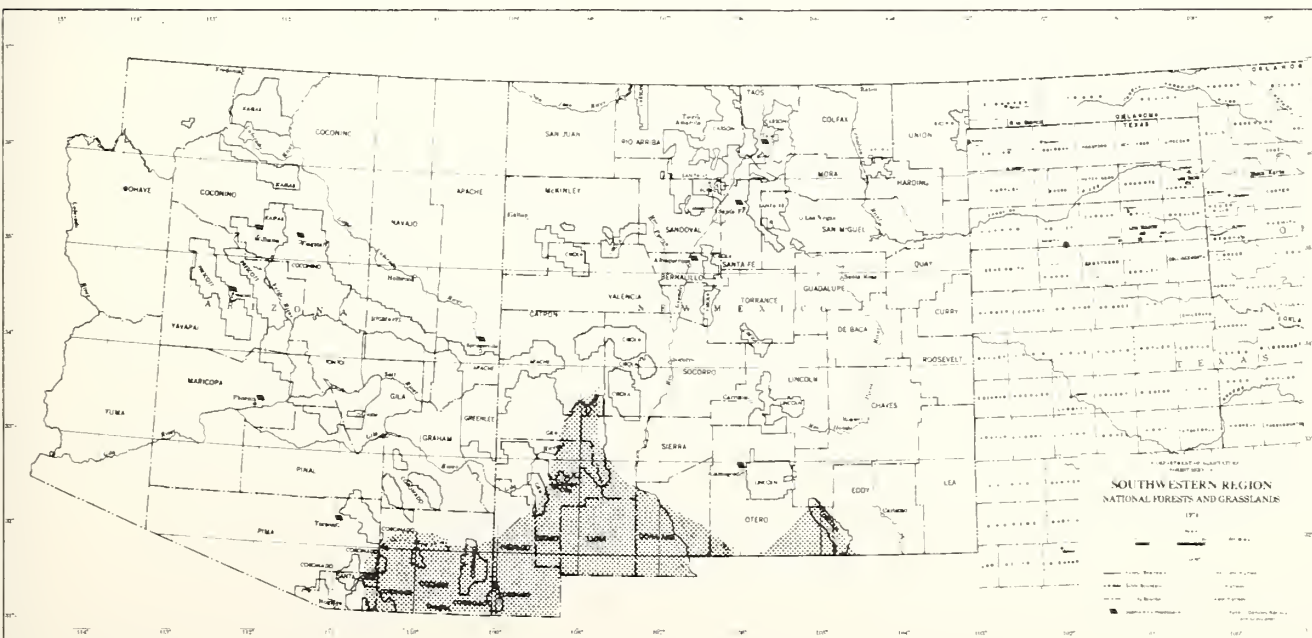
Crotalus l. klauberiSTATUS: Unique

Similar to Mottled Rock rattlesnake, but with the widely spaced dark brown or black conspicuously contrasting with the lighter ground color, and without spotting between bands. Tip of tail is bright yellow. Ranges all the way from the desert grassland to the lower edge of the transition zone. Occurs on the Coronado National Forest, and probably on the west side of the Guadalupe Mountains on the Lincoln National Forest.



ROCK RATTLESNAKE

In the absence of a photo for this subspecies, the rock rattlesnake whose appearance is nearly identical is shown.



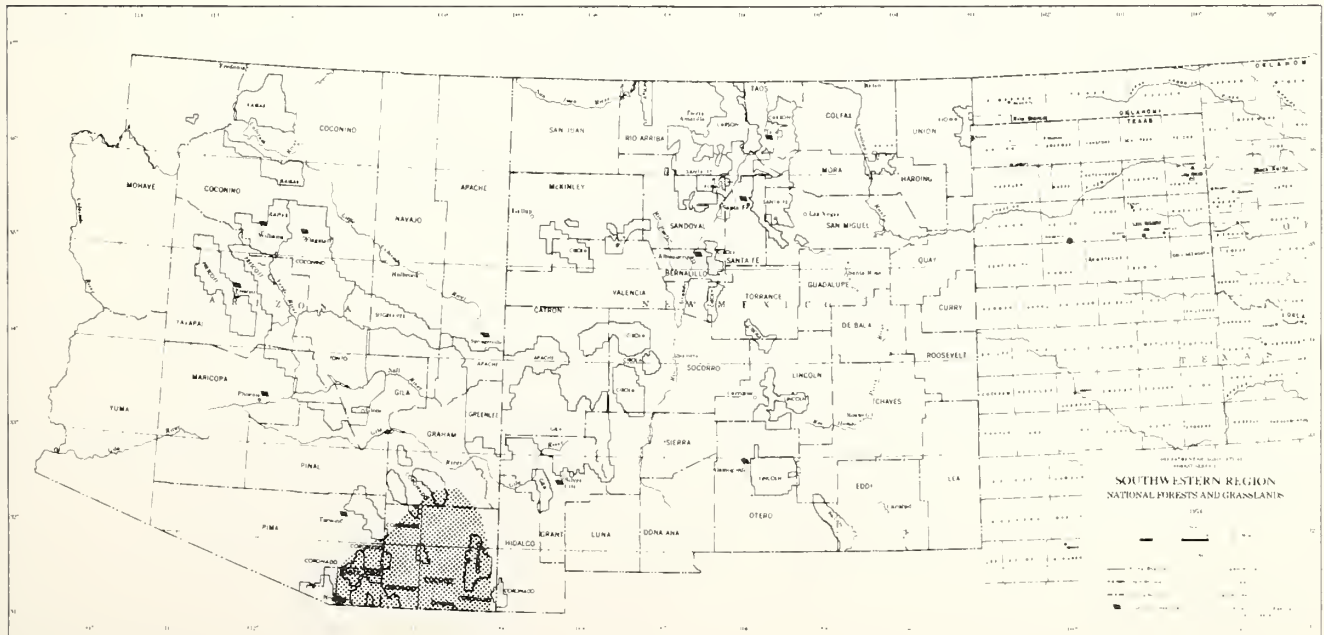
TWIN-SPOTTED RATTLESNAKE

Crotalus priceiSTATUS: Unique

Another small (12-26 inches) rattlesnake identified by two rows of dark brown spots down the back. Found at the higher elevations, among the rocks in the coniferous and pine-oak forest. Found in this Region only on the Coronado National Forest in the Graham, Santa Rita, Huachuca, and Chiricahua Mountains.



TWIN-SPOTTED RATTLESNAKE



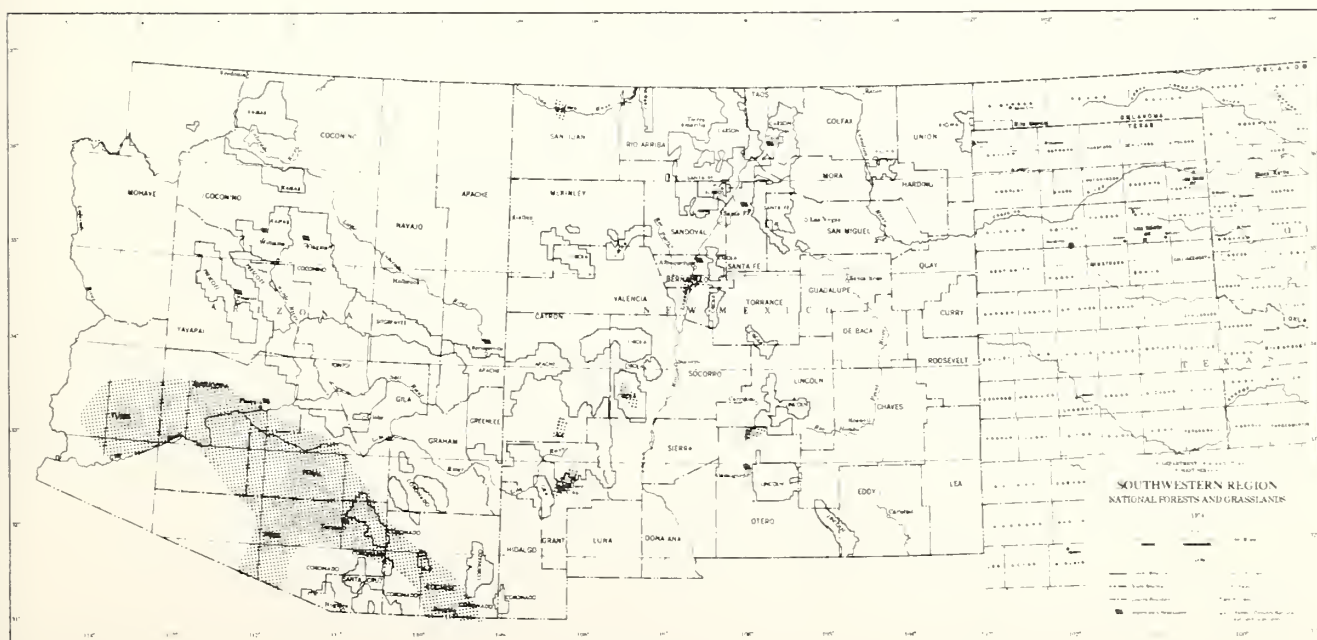
PRAIRIE MERLIN

Falcon columbaris richardsonii (Ridgeway)

Prairie Pigeon Hawk, Richardson's Pigeon Hawk

STATUS: Unique

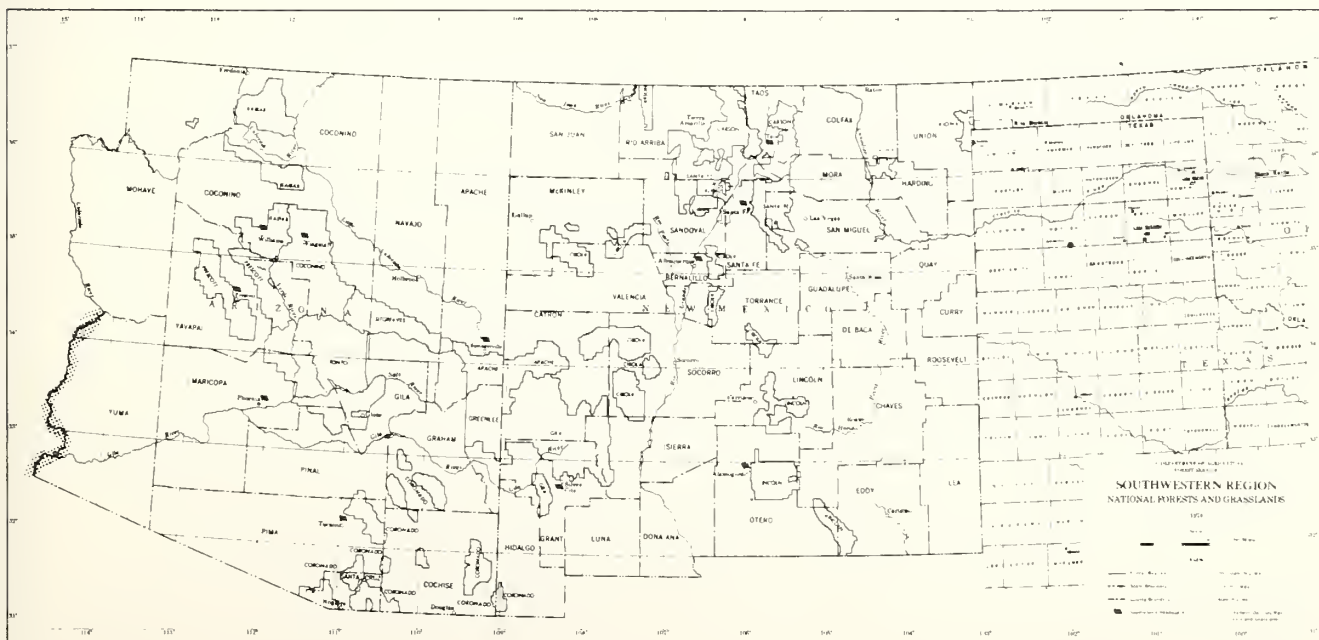
A medium sized, pointed-winged, long-tailed hawk. This is a light colored subspecies found in the open country of the eastern plains of New Mexico and grasslands of Arizona.



SNOWY PLOVER

Charandrius alexandrinum (Linnaeus)STATUS: Unique

A small, pale, sandy-brown backed, white breasted plover with dark legs and ear patch and slender bill. A shore bird around beaches, sand or mud flats.



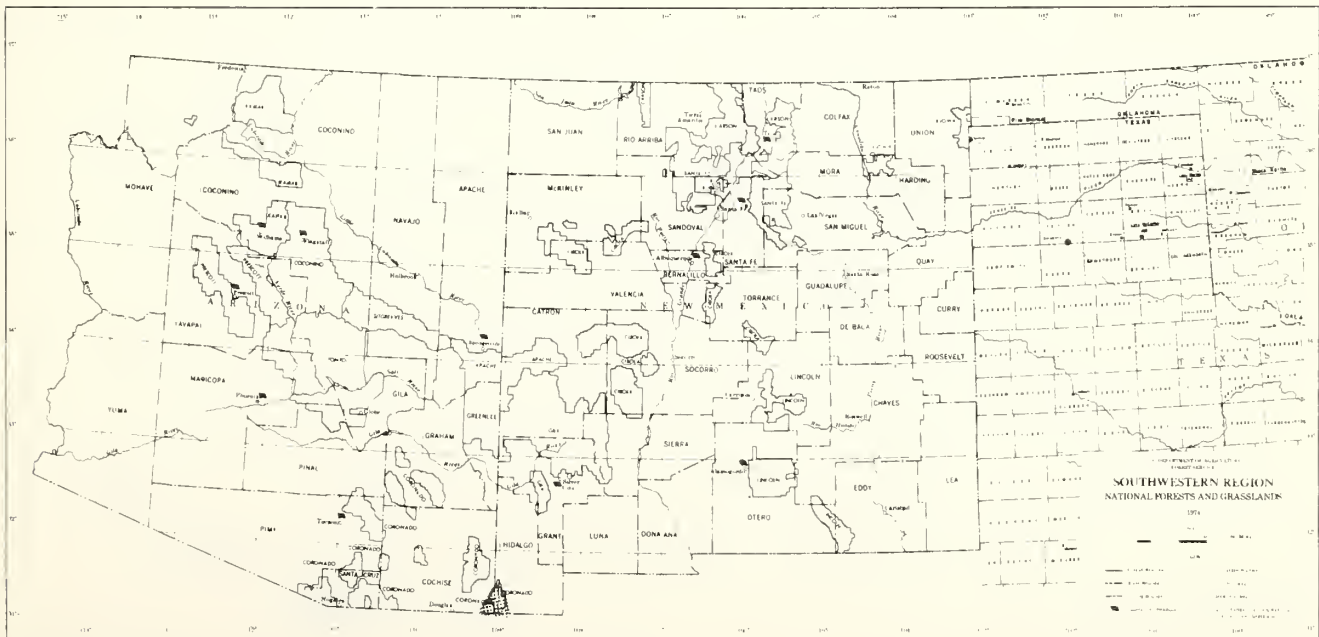
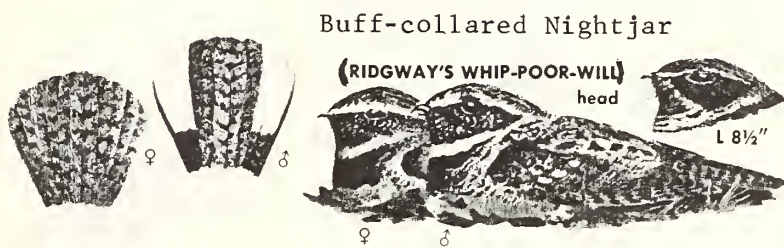
BUFF-COLLARED NIGHTJAR

Caprimulgus ridgwayi (Nelson)

Ridgway's Whip-poor-will, Cockaheea

STATUS: Unique, (Group II, New Mexico)

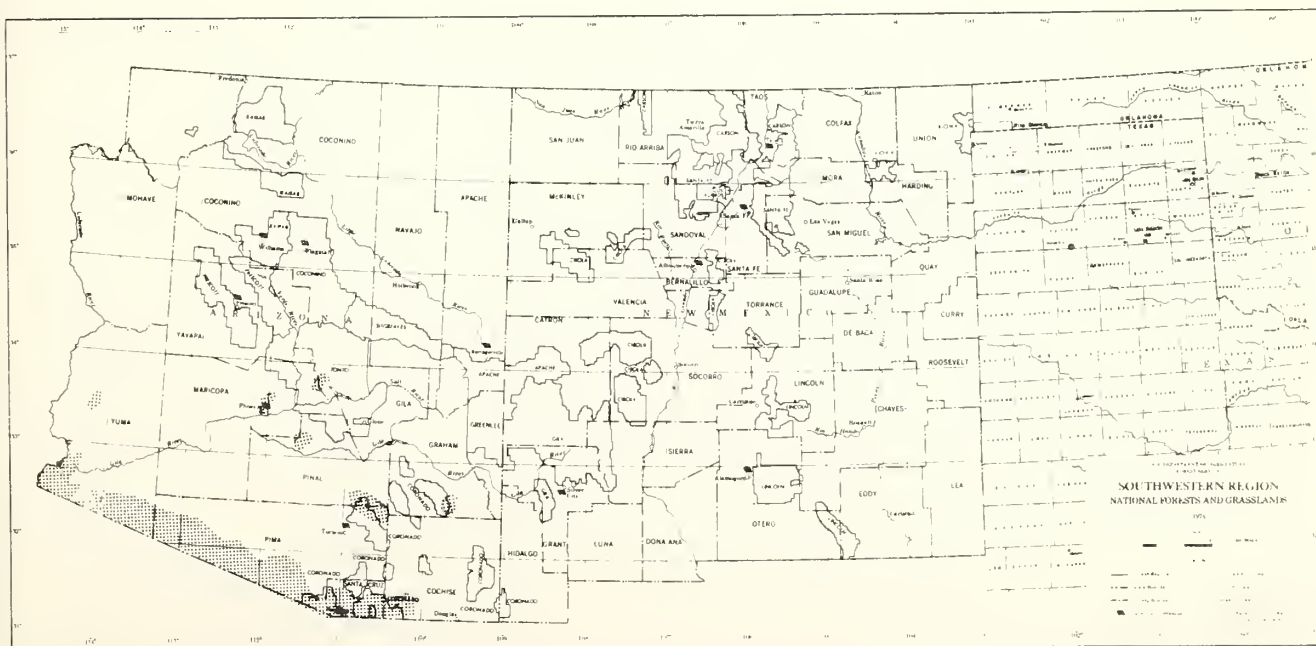
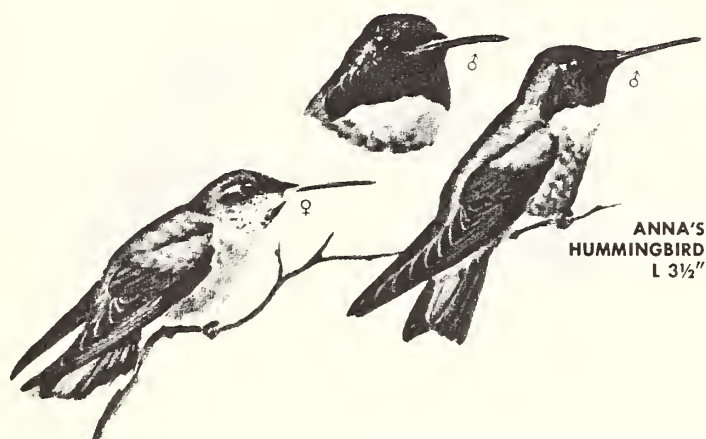
Similar to the common whip-poor-will, but distinguished by a tawny or buffy collar around the back of the neck. The song is distinctively different from the common whip-poor-will. Known in this country only from the Guadalupe Canyon of the Peloncillo Mountains.



ANNA'S HUMMINGBIRD

Archilochus anna (Lesson)STATUS: Unique

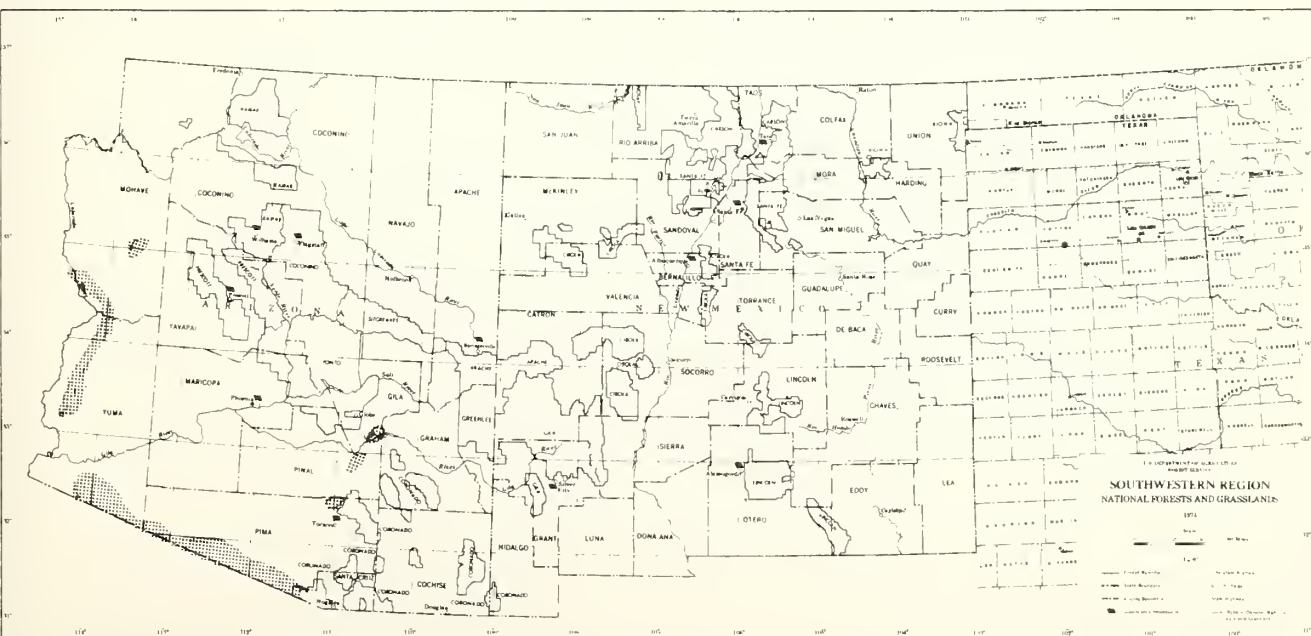
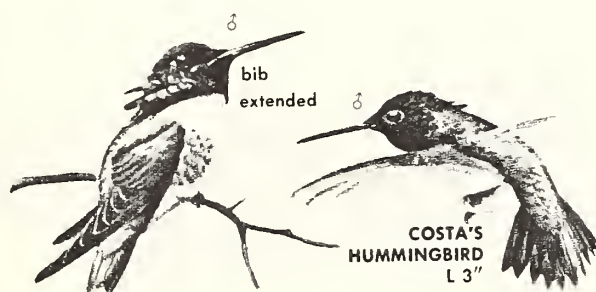
This is the only hummingbird seen in the United States which has a red crown as well as a red throat. The female does not have this field mark and is difficult to distinguish from females of other species. A winter resident of the chaparral and broken woodlands, frequently seen at feeders in the southern part of Arizona, rarely seen as an accidental visitor in New Mexico.



COSTA'S HUMMINGBIRD

Archilochus costae (Bourcier)STATUS: Unique

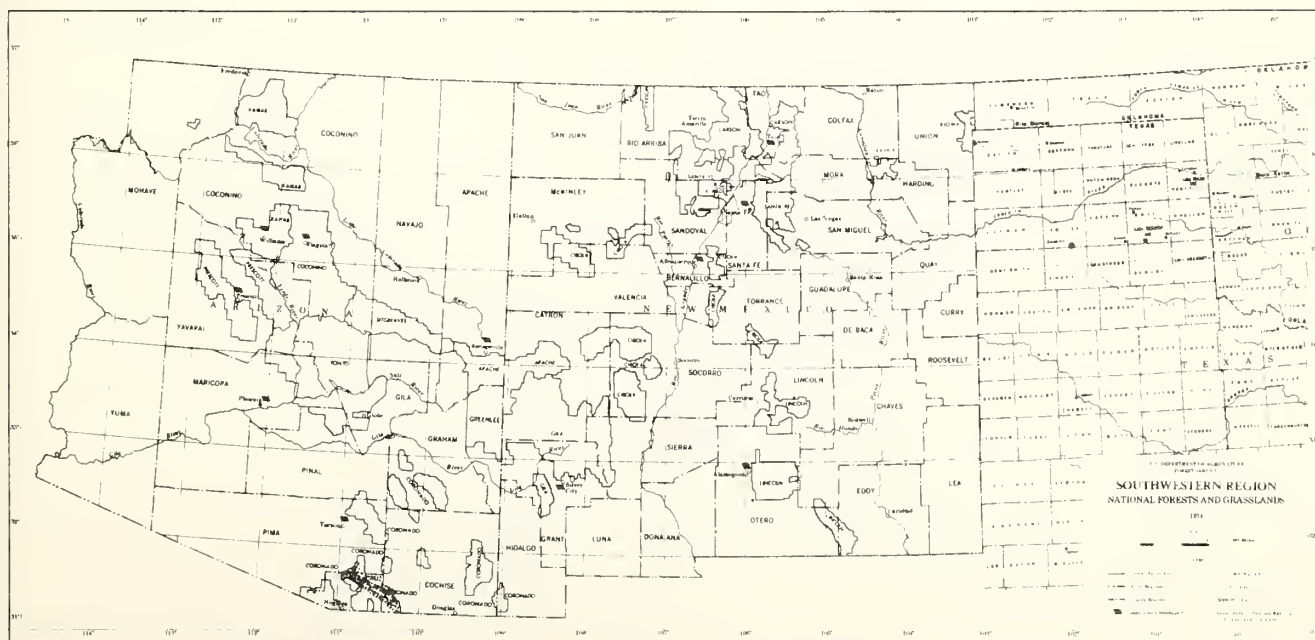
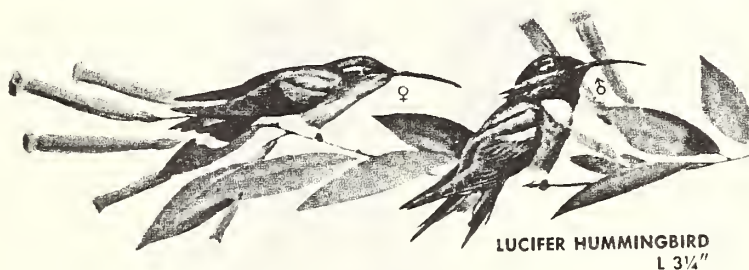
Similar to previous species but without decurved bill, and with purple crown as well as throat. Gorget projects obviously at side of neck. Female difficult to distinguish. A resident of the arid Sonoran desert type country, which is most frequently seen at feeders in the Santa Catalina, Santa Rita, and Chiricahua Mountains. Not likely to be seen between late August and the end of December.



LUCIFER HUMMINGBIRD

Calothorax lucifer (Swanson)STATUS: Unique

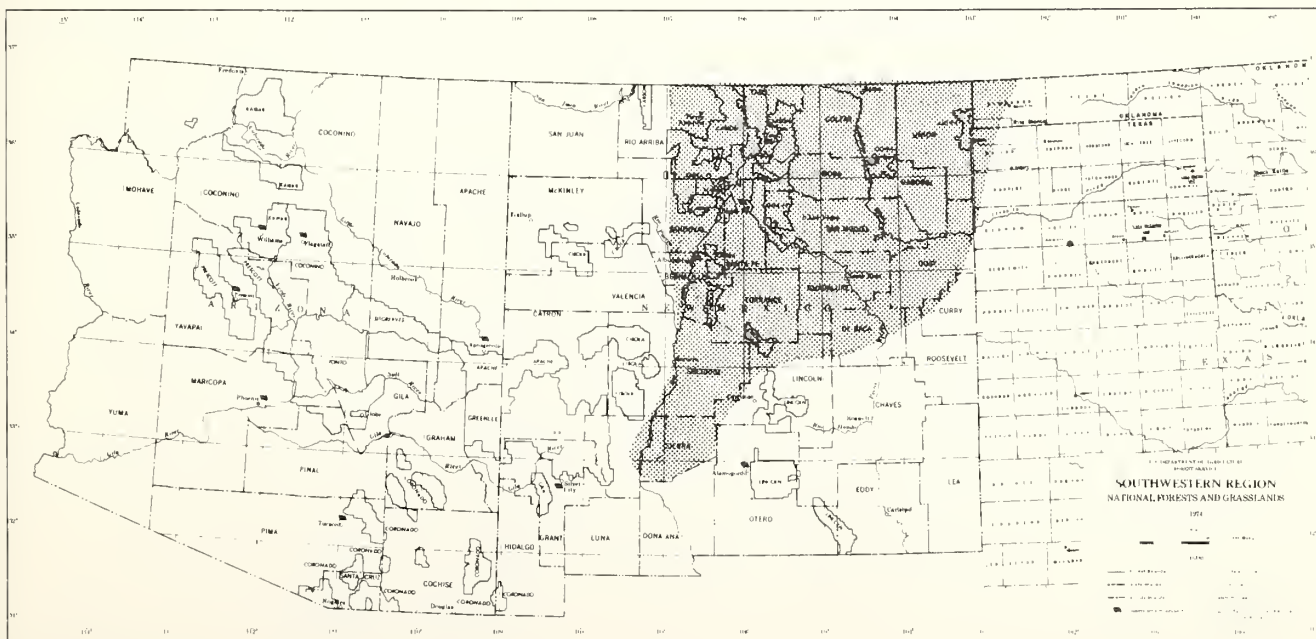
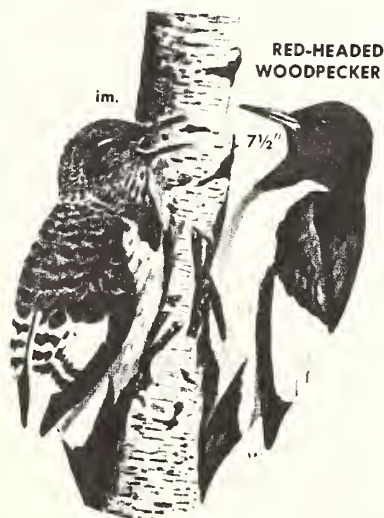
A medium-sized hummingbird, distinguished by a definitely decurved bill. The male has a purple throat, the female a buff breast and belly. An accidental visitor north of the Mexican border, this bird is most likely to be found at feeders in the Huachuca and Santa Rita Mountains or among the agave on arid hillsides.



RED-HEADED WOODPECKER

Melanerpes erythrocephalus (Linnaeus)STATUS: Unique, (Group II, New Mexico)

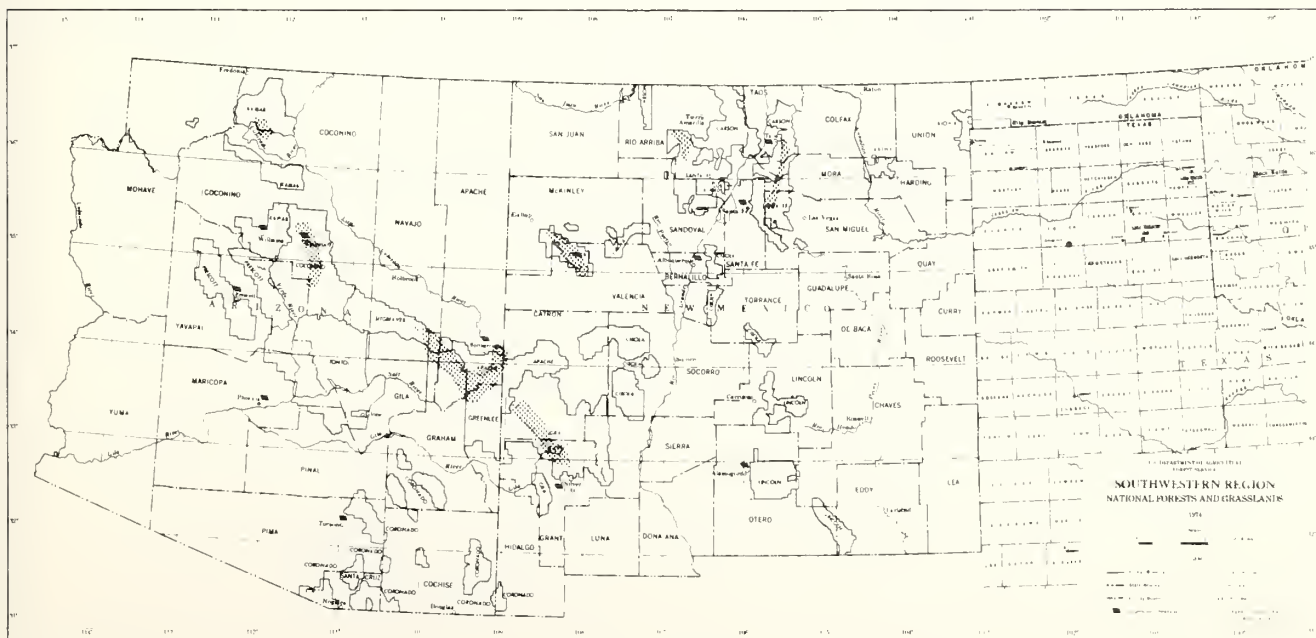
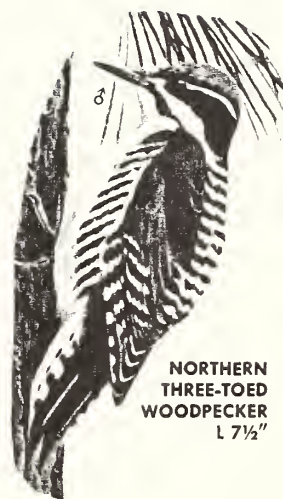
The only medium-sized woodpecker with a completely red head. Summers very locally in riparian woodland west into the central Rio Grande and Pecos Valleys in New Mexico.



NORTHERN THREE-TOED WOODPECKER

Picoides tridactylus (Linnaeus)STATUS: Unique

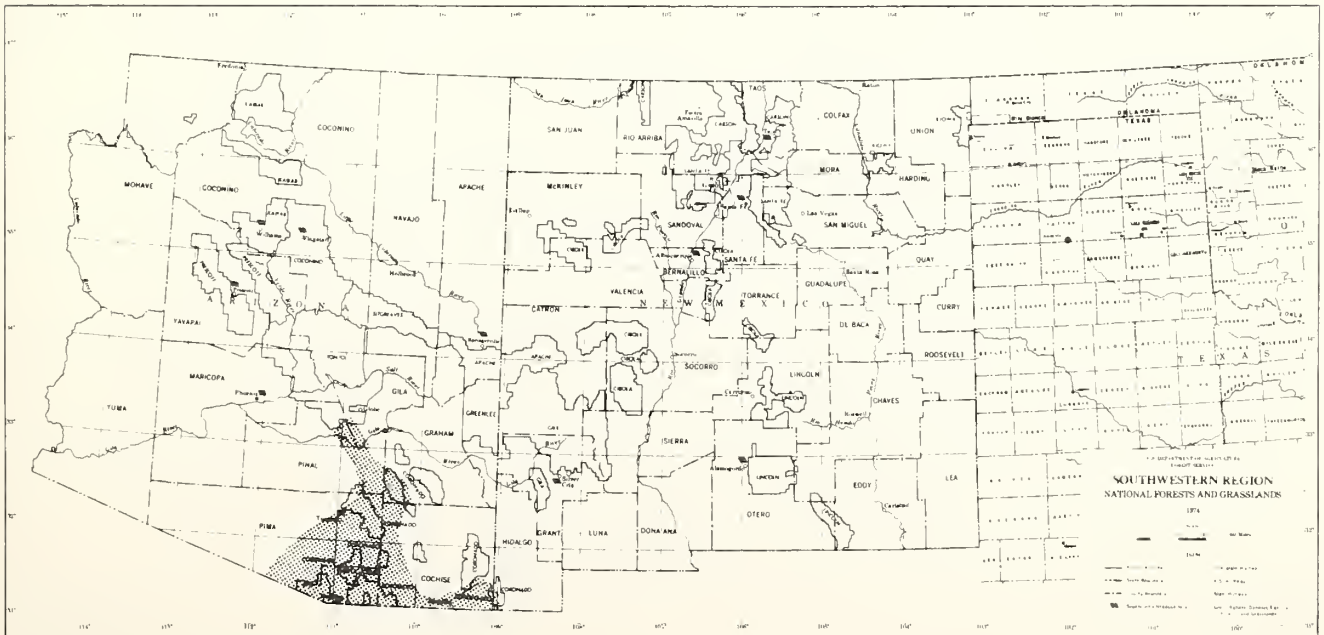
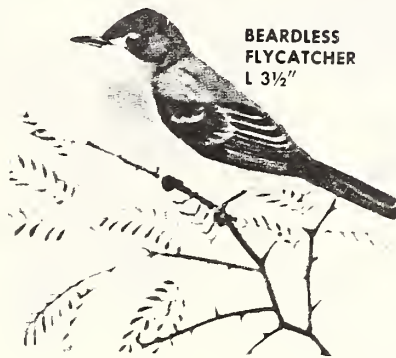
A medium-sized, dark colored woodpecker with a yellow crown. An uncommon resident of the high mountains. Found in the white and San Francisco Mountains and on the Kaibab Plateau in Arizona and from the Mogollon and San Francisco Mountains northward in New Mexico. Most frequently found in fir and spruce-fir forests, but may occur locally into the upper edges of the pine forests.



BEARDLESS FLYCATCHER

Campostoma imberbe (Sclater)STATUS: Unique, (Group II, New Mexico)

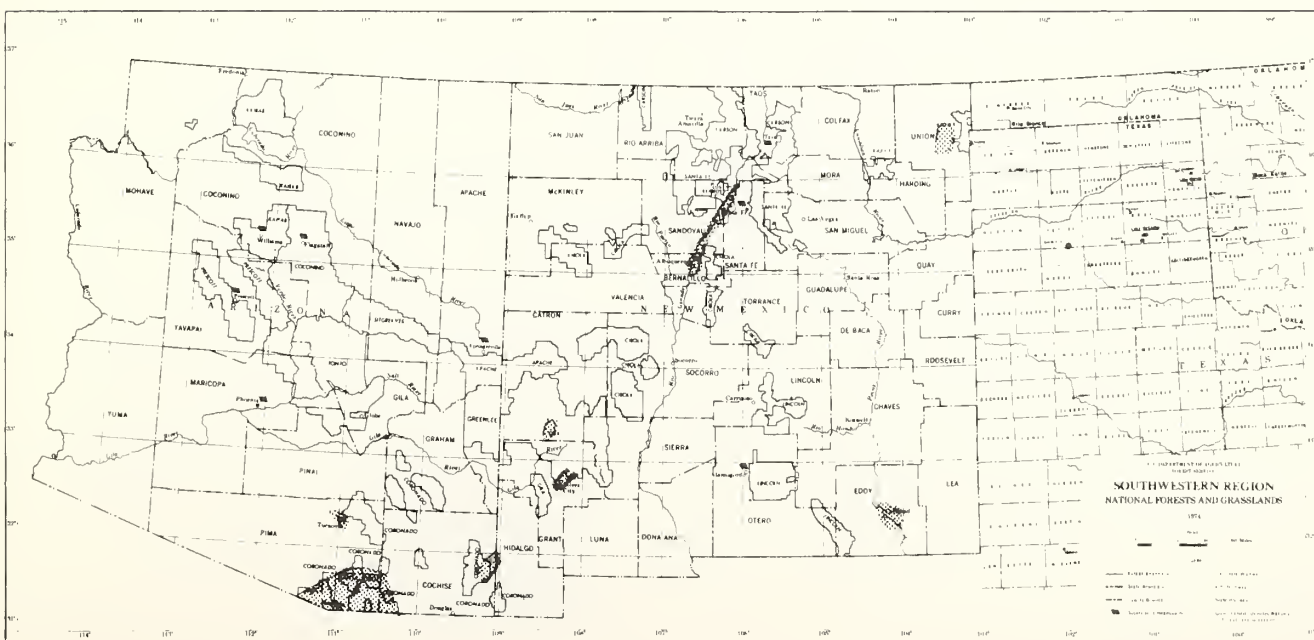
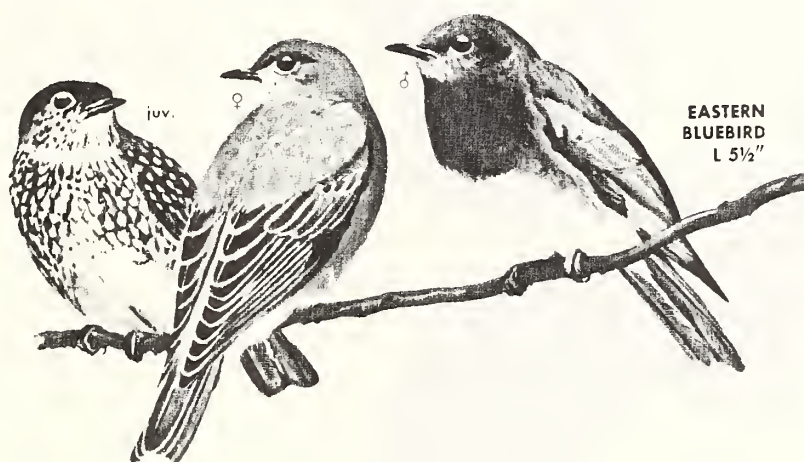
The smallest of the flycatchers found in the United States. Dark gray above, dirty white below, with no shape, distinguishing field marks. A summer resident of the riparian and microphyll woodlands of southeastern Arizona, north to the Gila River. An irregular summer resident of the Guadalupe Canyon in the Peloncillo Mountains.



AZURE (EASTERN) BLUEBIRD

Sialia sialis fulva (Brewster)STATUS: Unique

A paler colored subspecies of the common eastern bluebird which is distinguished by its uniformly blueback, brickred breast, and white belly. A rare local resident of southwestern Arizona in the live oak woodland and adjacent pines of the transition zone.



ALLEN BIG-EARED BAT, MEXICAN BIG-EARED

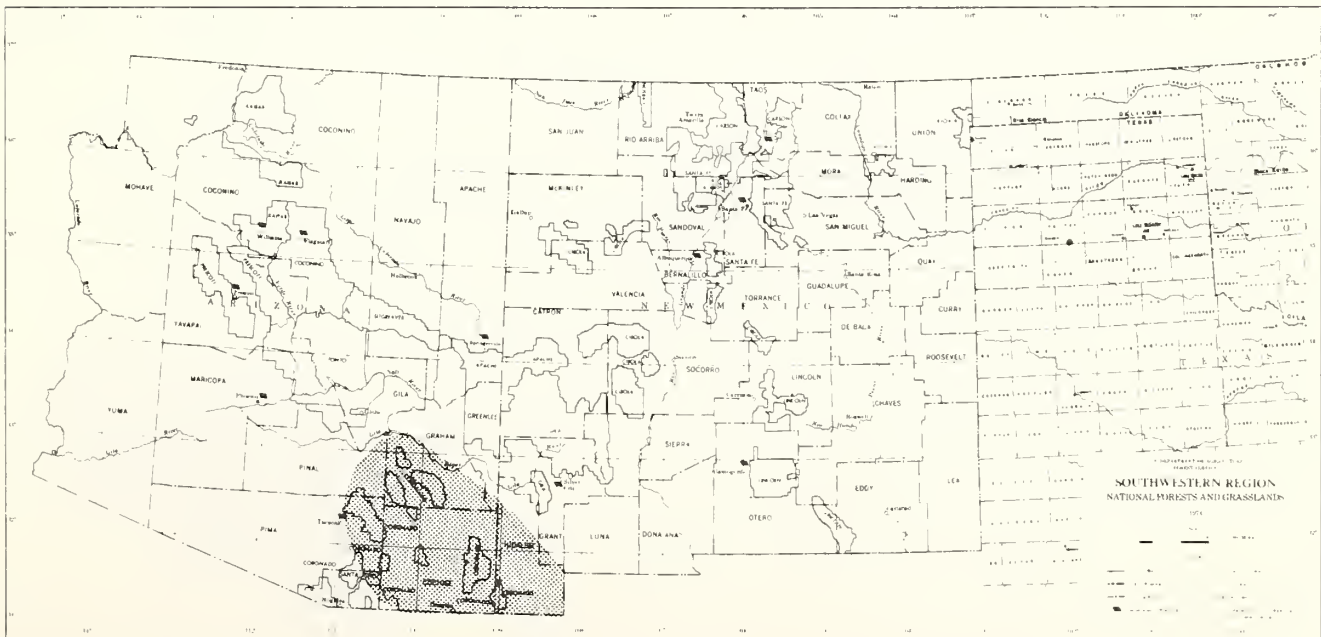
Plecotus phyllotis (Allen)

STATUS: Unique

A recently discovered (1955) but fairly common bat, which dwells in caves in the mountainous mid-sections of Arizona and New Mexico. The range of this species is not fully known. This species is distinguished by exceptionally large ears, with a unique pair of lappets extending from their base over the top of the snout. The general color is light tan to nearly black, with a conspicuous white tuft behind each ear.



2. Big-eared Bat



POCKETED FREE-TAILED BAT

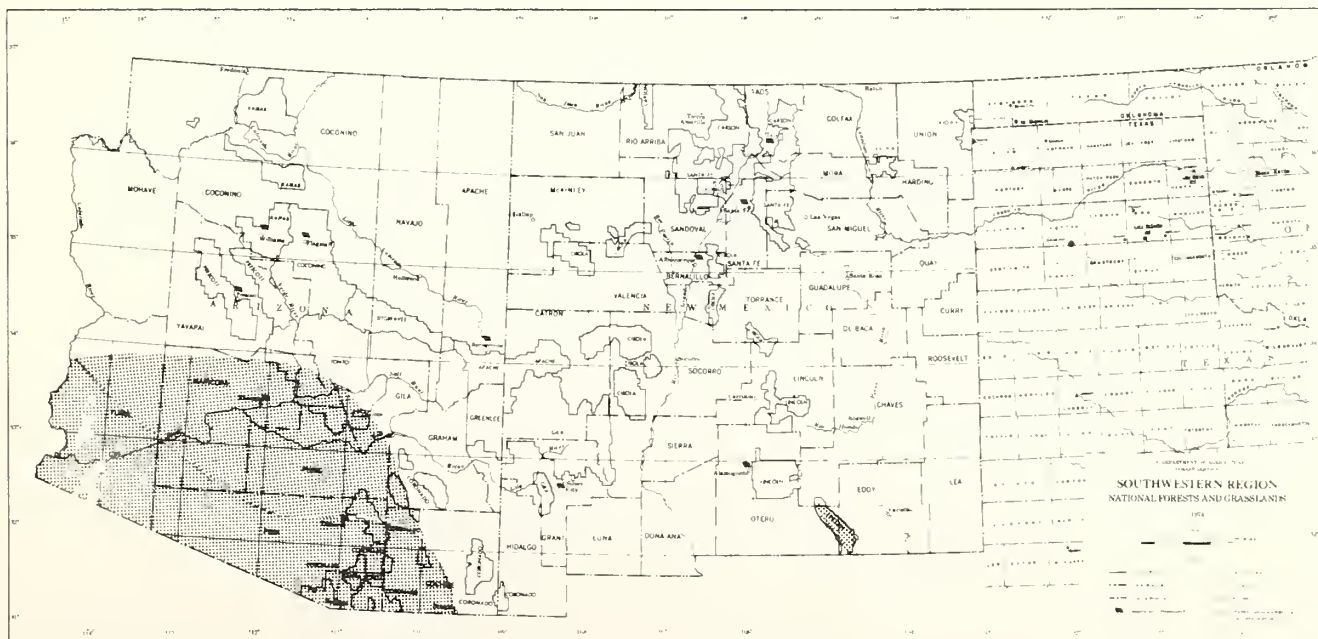
Tadarida femorosacca (Merriam)STATUS: Unique

This bat is recognized by the tail extending beyond the web of skin from the hind legs and the ears being joined at the base. Roosts in caves and crevices in rocks. The range in this Region is limited to extreme southern Arizona from Fort Huachuca west, and the Guadalupe Mountains of New Mexico.

In the absence of a photo for this species, the Mexican free-tail bat whose appearance is nearly identical is shown.



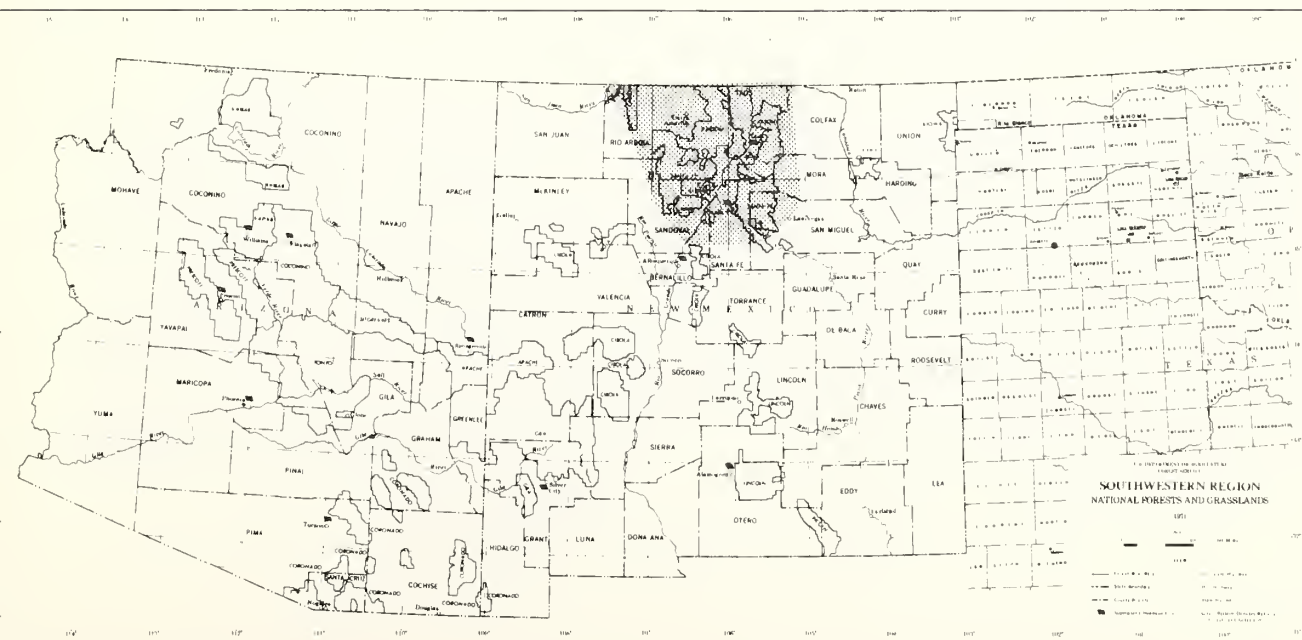
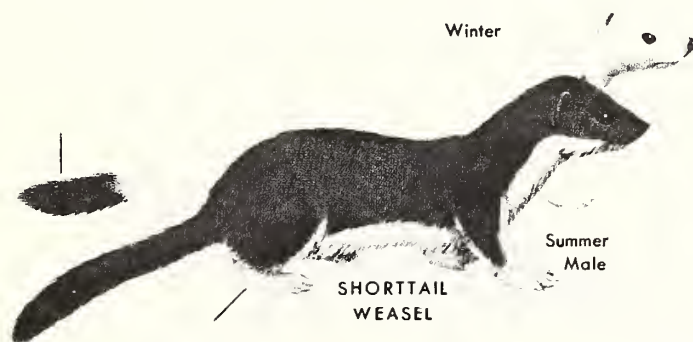
MEXICAN FRETAIL
BAT



ERMINE, SHORT-TAIL WEASEL

Mustela erminea (Linnaeus)STATUS: Unique

A small weasel (8-9 inches plus tail) with a tail less than half the length of the body. Pure white in winter, except black tip on tail. In summer, rich dark brown with white under parts and feet and black tip on tail. Most likely to be found above 10,000 feet, in brushy or wooded areas, near water on the Carson or Santa Fe National Forests.

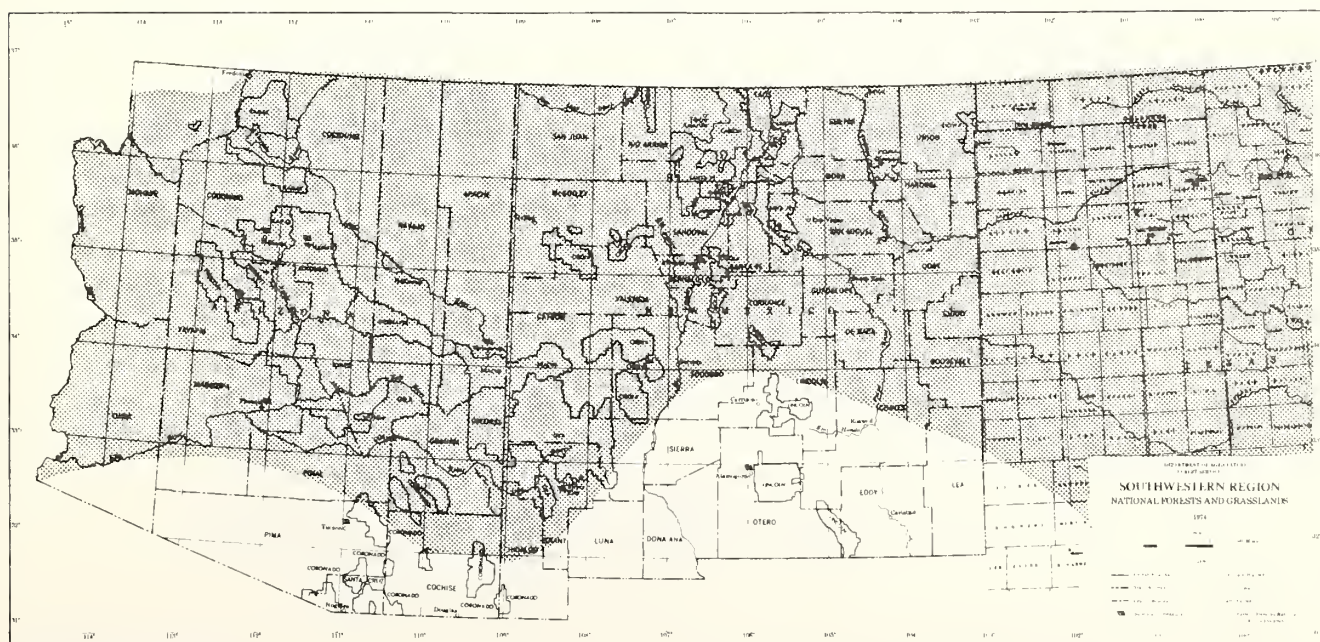


OTTER, RIVER OTTER

Lutra canadensis (Schreber)STATUS: Unique, (Group I, New Mexico)

A large weasel-like mammal, dark brown above, silvery cast below, webbed feet and small ears. The tail is quite thick at the base. An aquatic mammal but may travel over land several miles to reach another stream or lake.

Nearly extinct in the Region. Last known occurrence was in the Salt River, Tonto National Forest.



HOODED SKUNK

Mephitis macroura (Lichtenstein)

STATUS: Unique

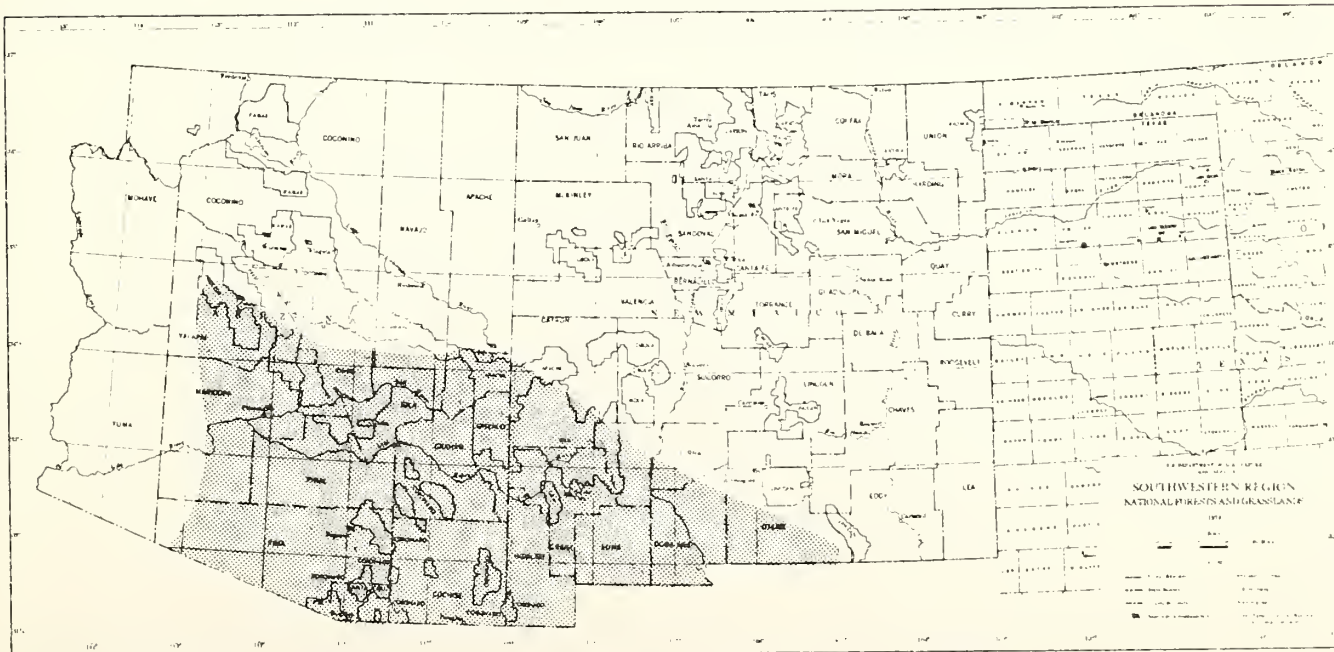
About the size of a common skunk, but with tail as long as head and body and ruff of hair on back of neck. May either have back nearly all black or chiefly white, including tail. Either form has two narrow white stripes on the side and totally black underparts.



Hooded Skunk

Inhabits areas along streams or rocky ledges in southeast and south central Arizona and southwestern New Mexico.

The species is periphreal in southern Arizona and southwestern New Mexico as these areas are at the northern limits of its range.

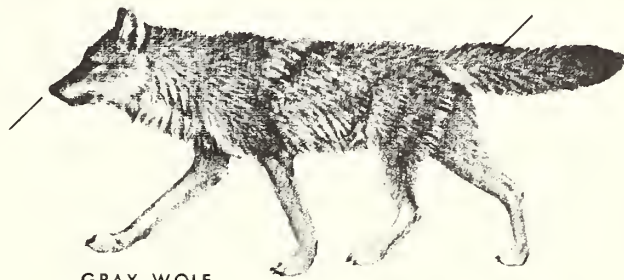


MEXICAN WOLF

Canis lupus baileyi (Nelson and Goldman)STATUS: Unique

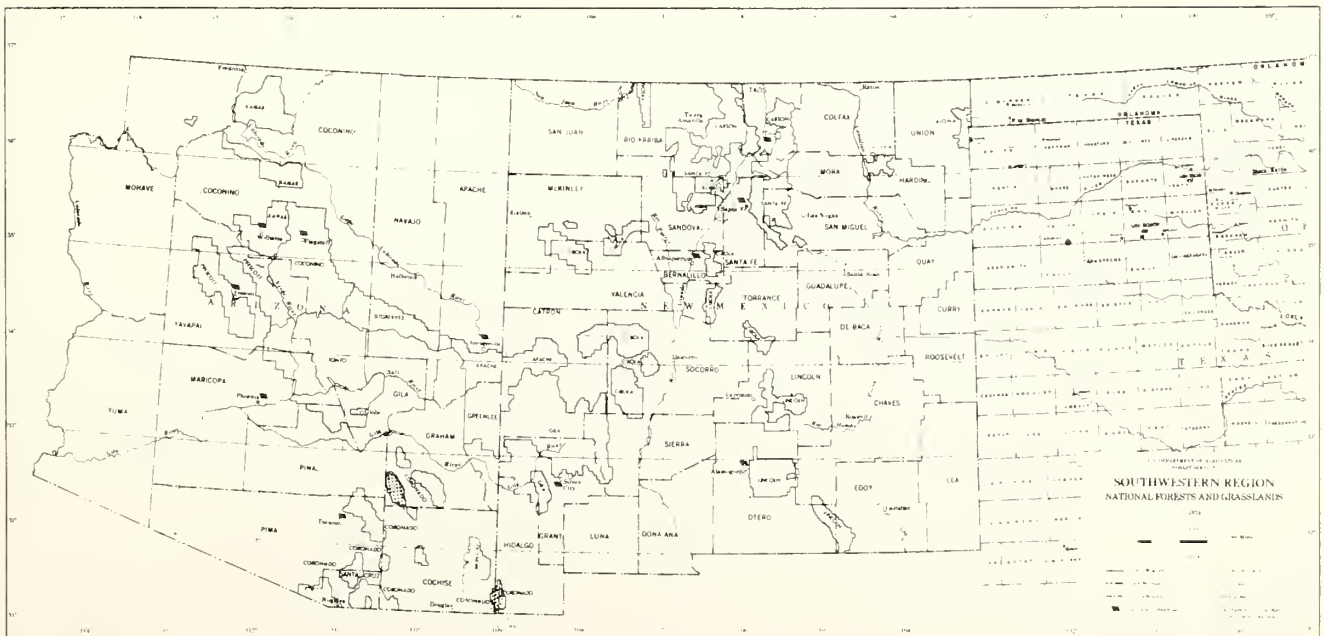
This is a subspecies of the gray wolf. It is distinguished from the similar coyote by its larger size, habit of carrying its tail high when running and a wide (more than 1") nose pad. Every few years, wolf sightings are reported in southeastern Arizona, often on the Coronado National Forest. Some are valid sightings of wolves that for unknown reasons have entered this peripheral portion of their range.

The species is much reduced from its former numbers in Mexico.



GRAY WOLF

In the absence of a photo for this subspecies, the gray wolf whose appearance is nearly identical is shown.



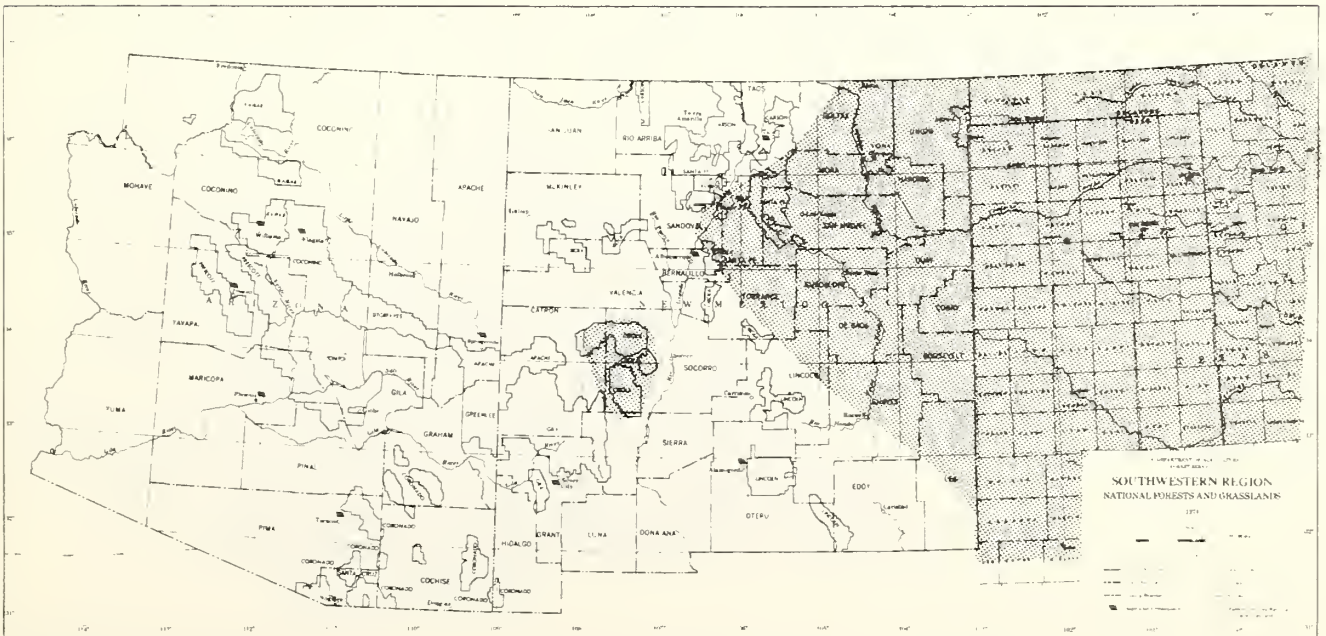
SWIFT FOX

Vulpes velox (Say)STATUS: Unique

A small buffy-yellow fox of the open desert and plains. It has a distinctive black tip on its tail and a blackish spot on either side of the snout. Most likely to be seen on Grassland districts of the Cibola.



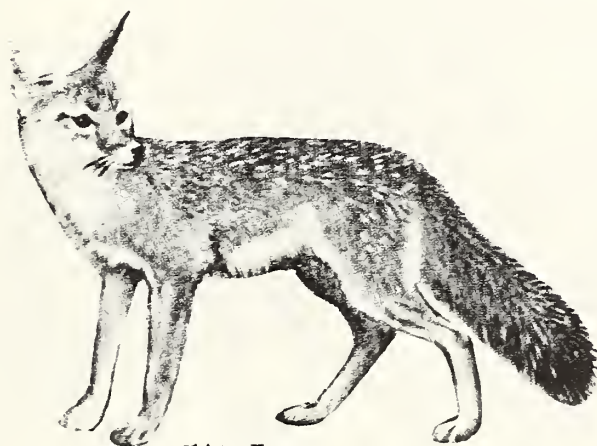
SWIFT FOX



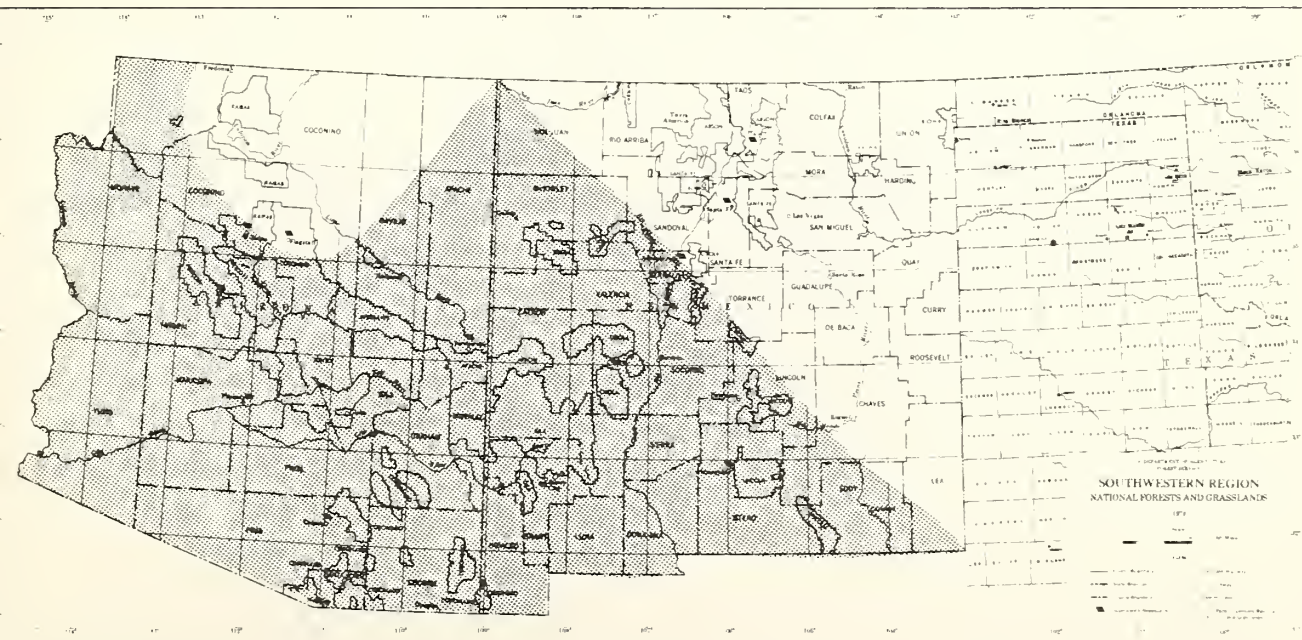
KIT FOX

Vulpes macrotis (Merriam)Status: Unique

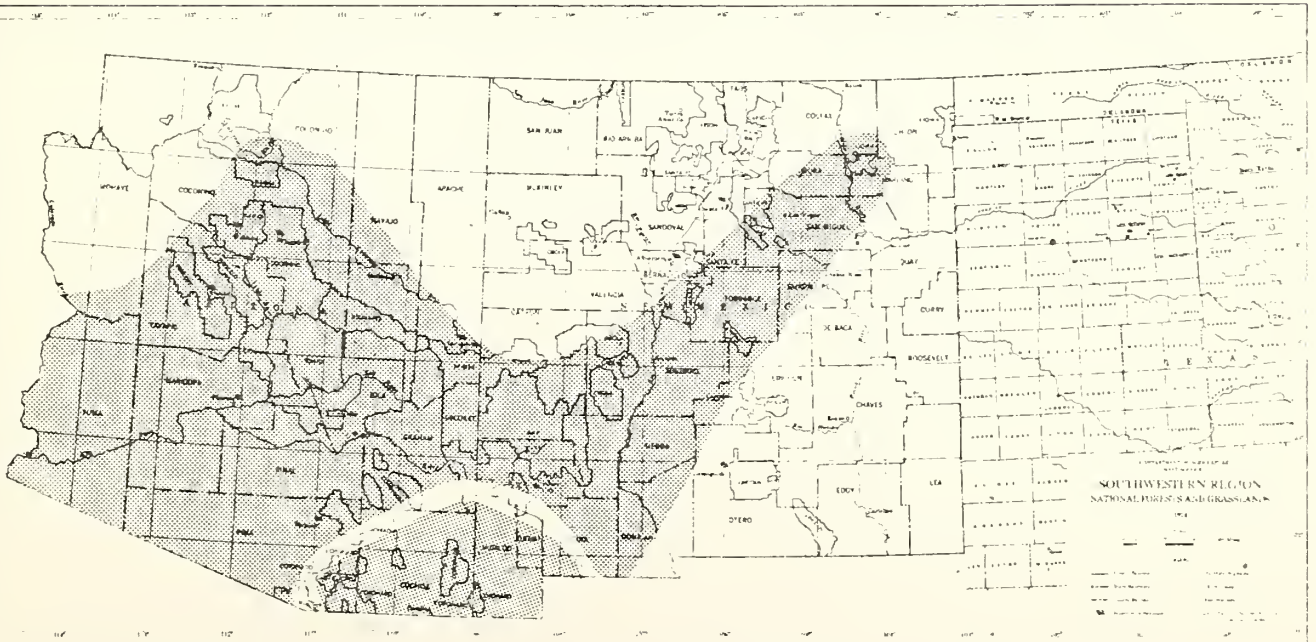
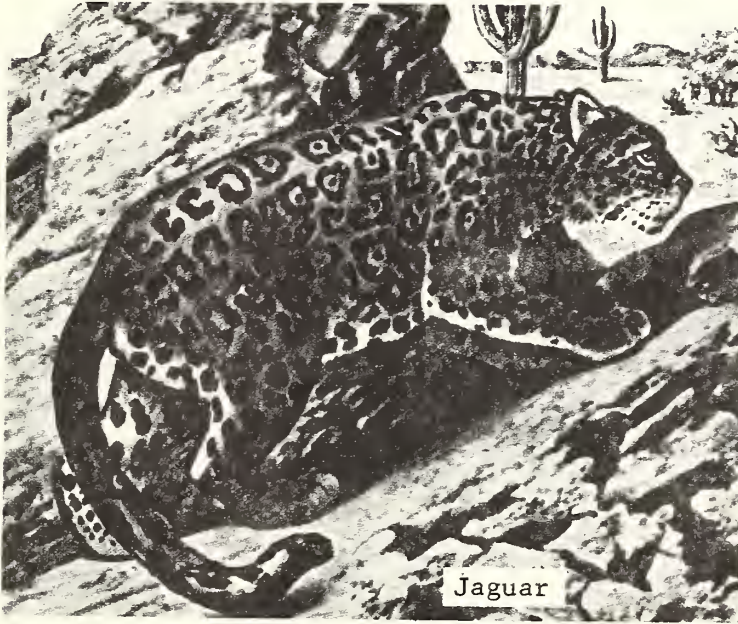
A small, pale gray, slender-bodied fox, with large ears, whitish belly and black tip on tail. This species is mostly nocturnal and ranges in the open, level, sandy areas within the juniper woodland and low desert vegetation.



Kit Fox



JAGUAR

Felis onca coriacea (Götz)STATUS: Endangered, (Group I, New Mexico)

REGIONAL DISTRIBUTION: An infrequent visitor to southern Arizona and southwestern New Mexico (smaller area - see map). Formerly recorded over a larger portion of Arizona, New Mexico and California (larger area - see map).

HABITAT TYPE ASSOCIATION: The infrequent visitor to Region 3 of this species appears to use open forests or chaparral of the lower mountains.

DISTINGUISHING CHARACTERISTICS: A large tawny colored cat, with dark spots on sides and back forming rosettes (a black outer ring with a black spot in the center).

REPRODUCTION: No data available.

FOOD HABITS: This large carnivore when present in Region 3 would be considered as opportunistic and capable of taking any animal present, including man and domestic livestock.

HAZARDS TO THE SPECIES: Man's alteration of the habitat, and hunting.

HABITAT REQUIREMENTS: No specific requirements can be deduced from the infrequent visit of the species.

PROTECTIVE MEASURES ALREADY TAKEN:

1. Listed as an endangered species in May of 1974 and thereby protected by the Endangered Species Act of 1973.
2. Protected by New Mexico's Endangered Species Regulation.

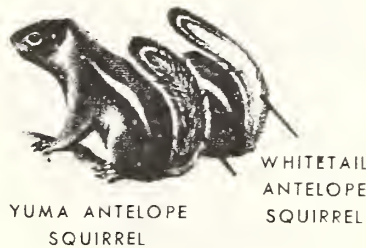
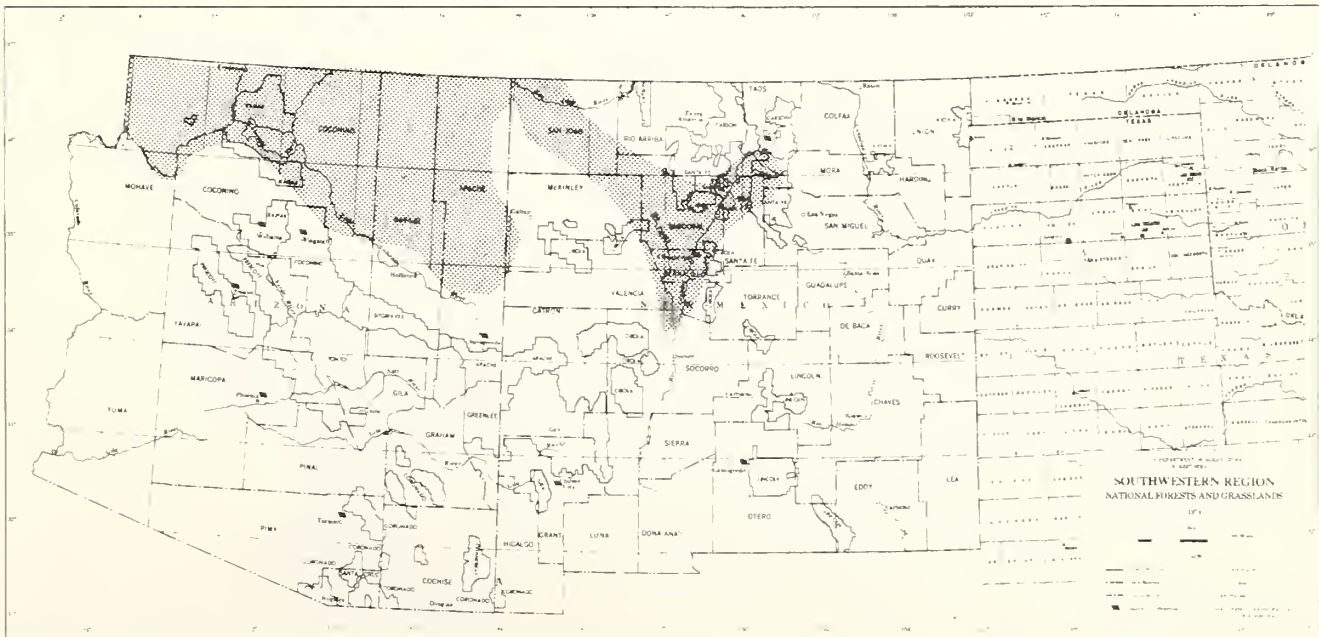
NOTES

WHITE-TAILED ANTELOPE SQUIRREL

Ammospermophilus leucurus (Merriam)STATUS: Unique

A small (7 1/2 to 9 1/2 inches including tail) squirrel with a warm gray body, white line on each side of back and white under surface of tail. No white on sides of head! Inhabits low desert foothills of northern and locally from northeast corner of New Mexico to the Jemez Mountains.

Another Texas Antelope Squirrel inhabits south central New Mexico as far north as the east foothills of the Manzano Mountains. It is considered to be a separate species by some (A. interpres).

YUMA ANTELOPE
SQUIRRELWHITETAIL
ANTELOPE
SQUIRREL

ARIZONA GRAY SQUIRREL

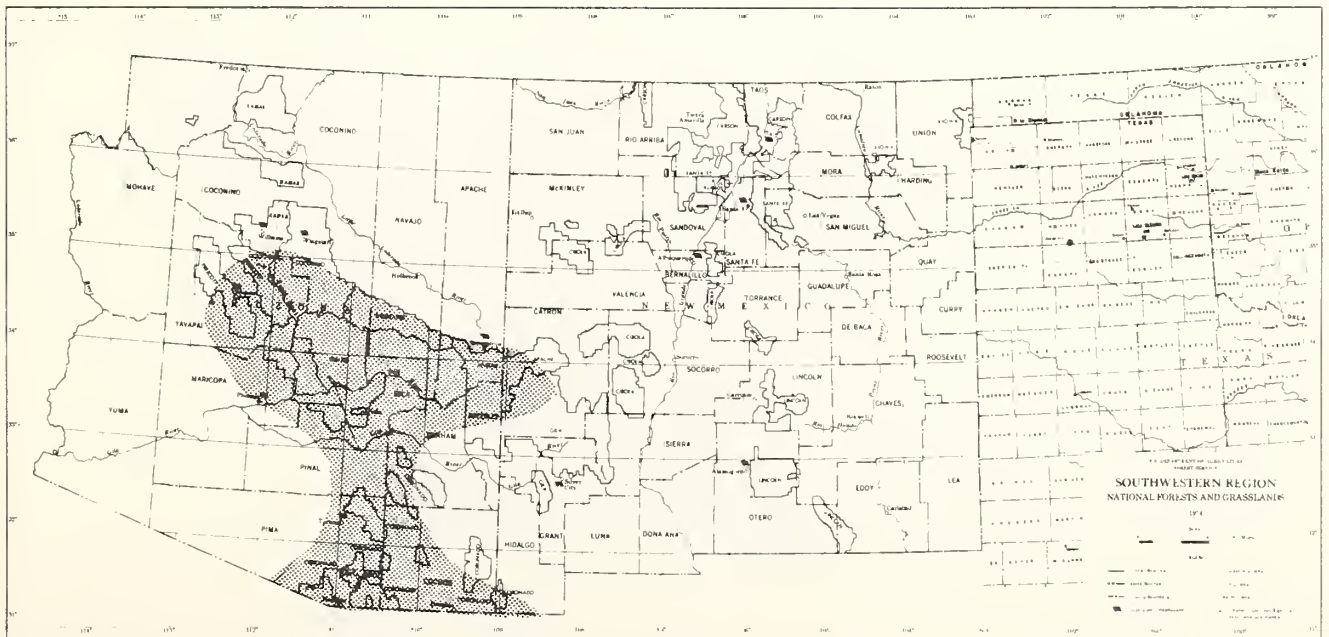
Sciurus arizonensis (Coues)STATUS: Unique(Including subspecies - s.a. catalinae and s.a. hauchuca)

A large, gray squirrel (up to 22-23 inches including tail), which is the common tree squirrel of the mountains of central and southeastern Arizona. Possibly on the New Mexico portion of the Apache-Sitgreaves National Forest in the San Francisco River area, and the Gila National Forest near Reserve. The subspecies occurs in the Santa Rita and Huachuca Mountains respectively. This squirrel is an inhabitant of the riparian thickets of canyon bottoms.



Gray Squirrel

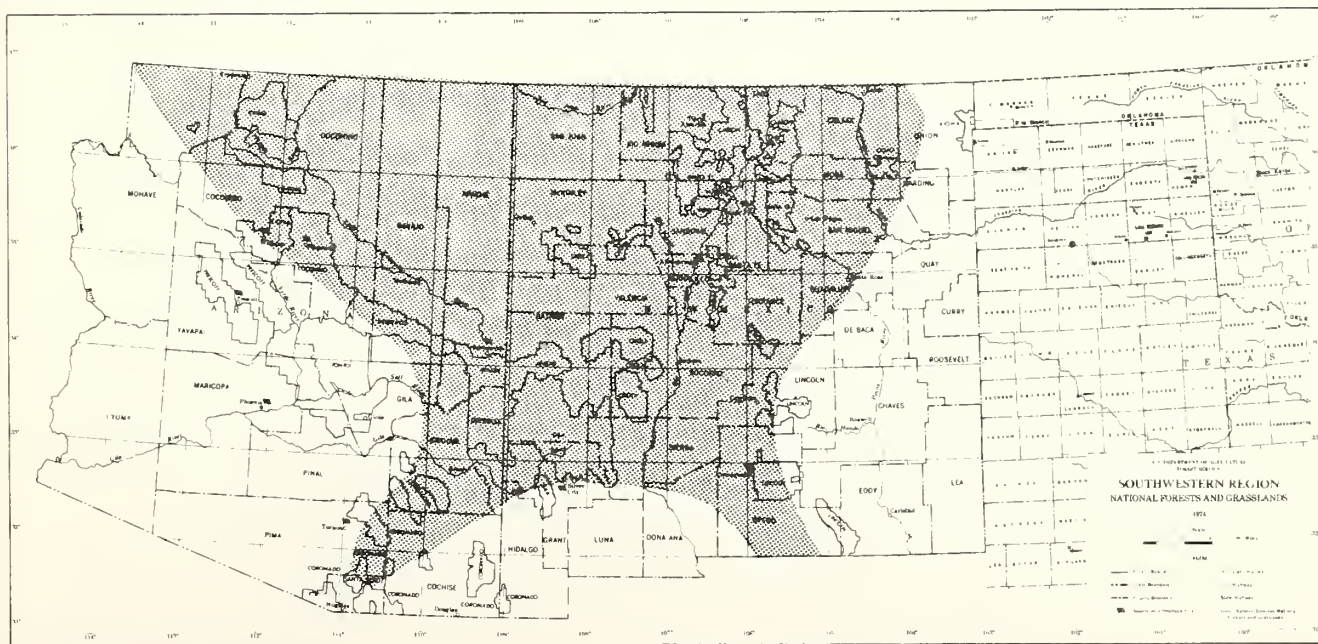
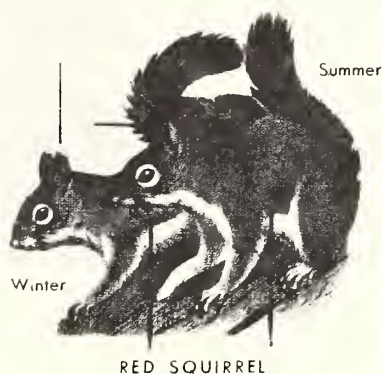
In the absence of a photo for this species, the gray squirrel whose appearance is nearly identical is shown.



RED SQUIRREL (SPRUCE SQUIRREL)

Tamiasciurus hudsonicus (Erxleben)STATUS: Unique(Including subspecies T. h. grahamensis, T. h. lychmuchus, T. h. mogollonensis)

A medium size squirrel (11-14 inches including tail) which is a uniform reddish or yellowish color. This squirrel is an inhabitant of the pine and spruce forests and mixed hardwoods of the transition zone. The subspecies are found in the Graham Mountains, Sacramento and Guadalupe Mountains, and the mountains of the Mogollon Rim and northern New Mexico respectively.



MOUNT GRAHAM LONG-TAILED VOLE

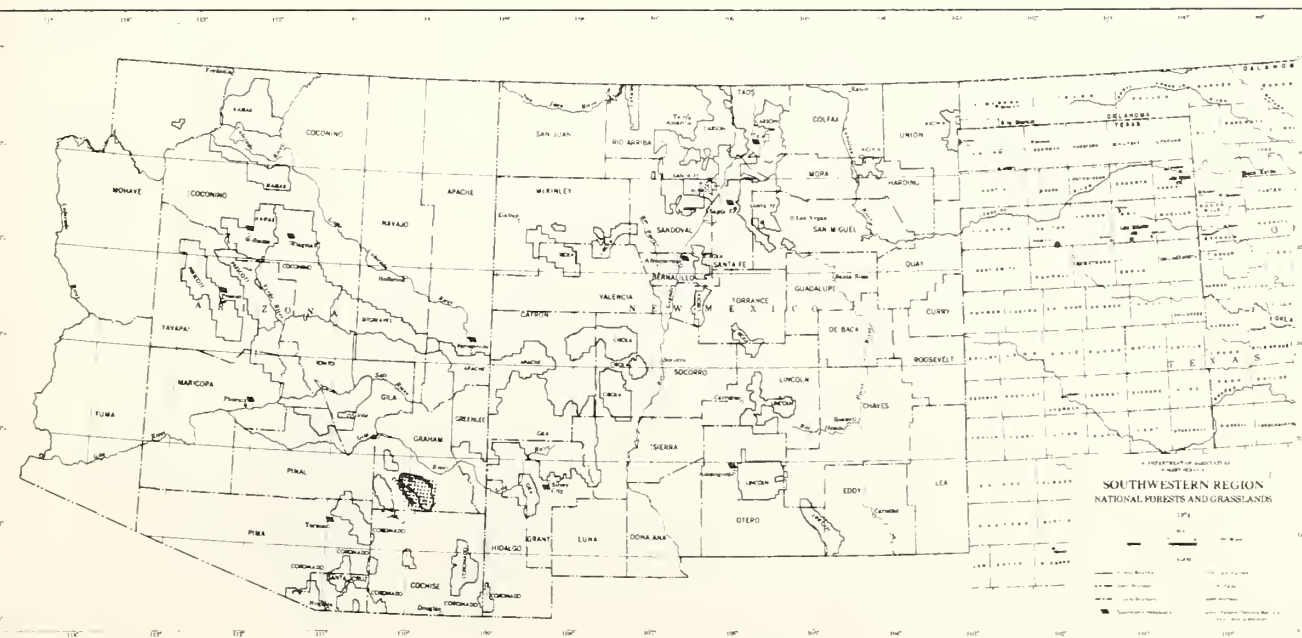
Microtus longicaudus leucophaeus (Allen)STATUS: Unique

This is an isolated subspecies of the longtailed vole (meadow mouse) which occurs only in the Pinaleno Mountains at elevations of 8,000 feet and above. Inhabits grassy areas along stream bands and in high mountain meadows. This subspecies is the only one found south of the Gila River. It represents the southern most extension of the range of the long-tail vole.



Long-tailed Vole

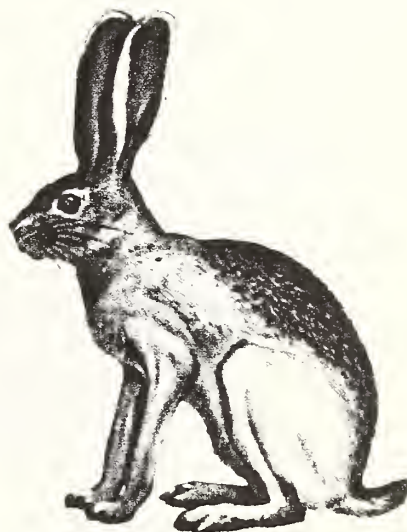
In the absence of a photo for this species, the long-tailed vole whose appearance is nearly identical is shown.



WHITE-SIDED JACKRABBIT

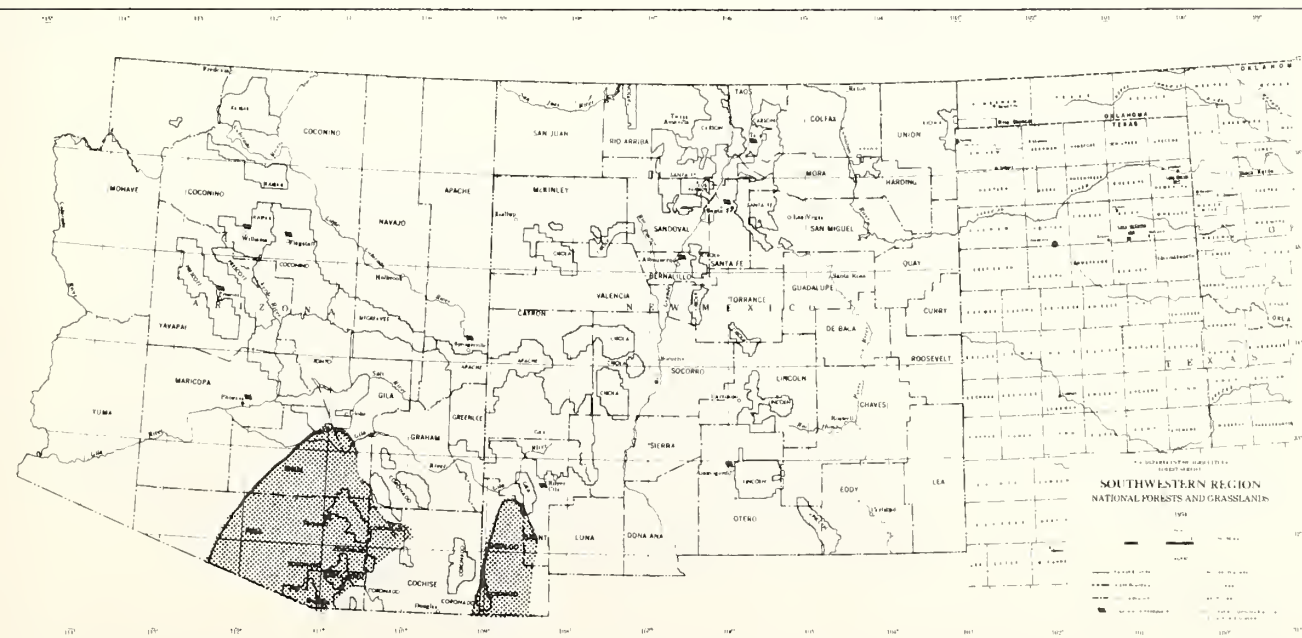
Lepis alleni (Mearns)STATUS: Unique, (Group I, New Mexico)

A large hare with long ears lacking a black tip, pale whitish sides and hips. A subspecies of the antelope Jackrabbit is found in the desert grassland and brush of extreme southwest New Mexico.



Antelope Jackrabbit

In the absence of a photo for this species, the antelope jackrabbit whose appearance is nearly identical is shown.

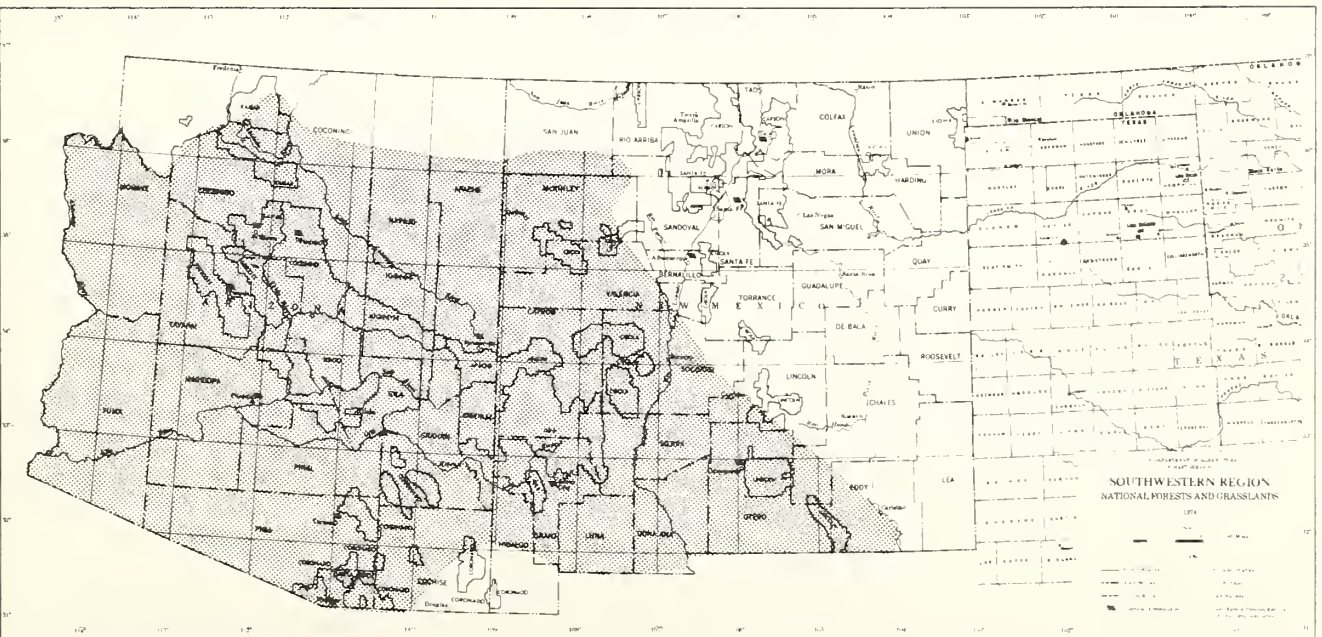


DESERT BIGHORN SHEEP

Ovis canadensis mexicana (Merriam)STATUS: Unique

A brown or gray-brown sheep with a white rump recognized by massive coiled horns (male). Female has smaller, uncoiled horns. Formerly native to the mountains of southern Arizona and New Mexico, the National Forest population is now limited to a small relict herd in the Santa Catalina Mountains.

In the absence of a photo for this subspecies, the bighorn sheep whose appearance is nearly identical is shown.

**BIGHORN SHEEP**

CONCLUSIONS

In summary, the material contained herein is presented in hopes of inspiring in all Forest Service personnel in Region 3 a sense of concern over the urgency in stimulating management programs needed to insure survival of our Endangered and Unique species.

These species are the visible indicators of some changes in our environment which are often so subtle as to be otherwise unnoticed and therefore unmeasured. Each occupies an ecological niche and makes a contribution to the whole of life. Nothing is surer than death and extinction, but the death of a species can be postponed longer than that of an individual. The biological impact of forever removing a species from the environment may not always be readily discernible, but something of value and which is irreplaceable, has been lost.

The responsibility for, and the efforts to, develop and undertake restoration programs should not be considered primarily those of any single agency. The problems of saving most of the Endangered and Unique species of fish and wildlife are extremely varied. Only through the cooperative efforts at all levels between local, state, and federal agencies, professional and non-professional workers, and interested citizens can there be achievement of management goals to save those forms of wildlife that may otherwise disappear from the scene.

The Forest Service must take the initiative in developing management programs that will protect the habitat of Endangered and Unique species which occur on National Forest administered lands. Once established, programs will assuredly receive in-service help, as well as outside support from other agencies and individuals.

In the period since the Region's first report, in 1967, on rare and endangered wildlife species, Forest personnel throughout the Region have made great strides in programs of habitat preservation. All personnel are to be commended for these management efforts, made in the face of limited manpower and monetary resources.

Through the management proposals outlined herein, and supplemented by the management objectives and coordinating requirements listed in the Region's Multiple Use Management Guide, Regional, Forest, and District personnel will be able to establish firm on-the-ground management programs. Some of the management proposals presented herein may apply only to an individual species, however, there are many proposals of a general nature which apply overall to the majority of these species. The Region's program and these management considerations can be summarized as follows:

1. The endangered species program is one of National scope and concern, which involves 11 species on National Forest lands in the Southwestern

Region.⁽¹⁾ An additional fifty-four unique species or sub-species which are worthy of special management consideration and action are included.

2. Continue to cooperate with local, state, and federal agencies, and private organizations, professional and non-professional workers, and interested citizens to gather life history information on species. This may involve contractual arrangements with State Game and Fish Departments. This information may include sight observations, habitat preferences, nesting locations, population levels and range.

In particular, cooperative efforts should include:

a. Participation with Arizona Game and Fish Department and New Mexico Department of Game and Fish and University personnel from both states in field inventory and research surveys for species and habitat restoration, re-establishment, and legal protection.

b. Contacts with wildlife biologists, fishery biologists, ichthyologists, ornithologists, mammalogists herpetologists and ecologists for life history requirements, species identification, and current status.

3. Forests should consider all unique and endangered species in their Wildlife Management Plan. Known nesting sites and areas of species inhabitation should be mapped and plotted on the Forest wildlife multiple use overlay.

4. In addition to the general Wildlife Habitat Coordination Measures for Region 3, which are included in Appendix III, Forests should give these species, special management consideration in all functional activities to provide for their preservation, particularly:

a. Prevent disturbance of nesting habitat of endangered species from all disrupting activities such as road, trail, power line and recreational site construction, mining activities, recreational uses, etc.

b. Provide for retention of suitable nest and roost trees within the species range.

c. Protect and preserve existing riparian habitat and other habitat types as necessary for certain species' existence. In some geographical areas, protection of sycamore and cottonwood groves, including dead trees, requires immediate attention to insure species survival. These areas may also require special measures to stimulate establishment of regeneration of riparian woodland species to ensure a full range of age classes, and a perpetual supply of suitable nest, roost and feeding trees.

(1) Eight other Endangered species occur outside the National Forests public lands within the States of Arizona and New Mexico.

d. Expand the water quality monitoring program to ensure clean water in Forest streams. Degradation or elimination of stream habitat can be caused by sedimentation, erosion, or pollution from road construction, mining activity, recreational sites or over grazing, for example.

e. Provide for fish habitat enhancement through construction of barriers, bank plantings, introduction of Endangered and Unique species and watershed rehabilitation, where necessary.

f. Provide for acquisition of additional land or reclassification of existing Forest lands, where applicable, for Endangered and Unique species management.

5. Recognition of the uniqueness of the ecological communities and ecosystems in southeastern Arizona and southwestern New Mexico which many of our Unique and Endangered species inhabit, warrants particular management emphasis at all times. Such emphasis must often include the establishment of special species or ecosystem habitat management areas. Several methods are available to establish special areas. The degree of management control can be suited to the needs of the conflicts etc. for each area.

Some of the possible methods are:

a. Establishment of Management Units as provided in the 8200 Land Use Planning section of the manual (specifically 8226).

b. Establishment of Zoological Areas, as provided for in the 2300 Recreation Management section of the manual (2360 Special Interest Areas, 36 CFR 294.1 and 2362.44 - Zoological Areas).

c. Establishment of Research National Areas (4063), which includes mention of critical habitat for Endangered and Threatened Species.

Research National Areas have these objectives:

(1) To assist in the preservation of examples of all significant natural ecosystems for comparison with those influenced by man.

(2) To provide educational and research areas for scientists to study the ecology, successional trends, and other aspects of the natural environment.

(3) To serve as gene pools and preserves for Threatened and Endangered species of plants and animals.

d. Establishing Endangered and Threatened species areas, 2633.4 and provisions for authority for closure of endangered species areas by the Regional Forester under regulation CFR 261, item (i).

6. The Forest Service will continue to encourage and welcome the assistance of various interested groups in the development and protection of special habitats.

Additional studies are needed to properly define life histories, to delineate natural range, to define habitat limiting factors and estimate current populations of individual endangered species to comply with the intent of the "critical habitat" criteria established by the Recovery Teams for each species. The Forest Service may need to increase manpower and monetary allowances in-service to support this program, and also continue financial grants to education institutions, research organizations and Fish and Game Departments.

The information in the booklet may be interesting and informative to a reader or planner, but it will be of no value at all to the species herein listed unless appropriate budgets are allocated to conduct the needed and necessary studies to determine species populations and ranges on Forest lands and plan for restoration programs.

7. One of the greatest needs at the present time in addition to management programs is an active, supporting I&E program in reference to the protection which already exists for many of the fish or wildlife species mentioned in this report. This information should be provided in the way of a brochure and distributed at the VIS centers. An occasional article in a national magazine in regard to an individual specie would also be desirable. Special leaflets covering special areas such as Madera Canyon, Cave Creek, Guadalupe Canyon (Coronado) and others would serve as information sources for several species.⁽²⁾

Continuance of existing Forest programs and the initiation of new ones adhering to the above listed management considerations can only serve to increase the survival rate of unique and endangered species, and provide for their retention of our Nation's fauna.

(2) Some areas have leaflets completed.

APPENDIX I

There are several areas involving private inholdings suitable and desirable for National Forest status in connection with the program of saving Unique and Endangered species. Three of these areas are within the Gila National Forest. Two of the three areas would benefit the Gila trout. One is on Spruce Creek within the Gila Wilderness and the other near the head of Diamond Creek within the Black Range Primitive Area. The area on Spruce Creek consists of several mineral patents totaling 151.32 acres. The area on upper Diamond Creek consists of a 40-acre parcel (known as the Running Water Tract) at the junction of Running Water Creek and Diamond Creek and a 160-acre one known as the Caves Place some 6 miles downstream.

The third general area consists of a single parcel of 320 acres lying along the main Gila River within the Big Burros Division. Unique birds in this area whose habitat depends upon the indigenous cottonwoods and sycamores include the zone-tailed hawk, gray kawk, black hawk, peregrine falcon, and the Rivoli's hummingbird. Recently the endangered Mexican duck has been a casual visitor to this vicinity. This parcel has been reclassified as desirable for acquisition as a result of the realization that it contains suitable habitat for the above-mentioned birds. It currently is included in the Land & Water Conservation Fund Act purchase plan for acquisition, when these funds become available.

In addition to these examples, the acquisition of other tracts such as on the Coronado (Madera Canyon) and the Coconino - Prescott (Verde River) will benefit Unique and Endangered species.

APPENDIX II

Geographical Areas of Special Interest (see map)

1. Chiricahua Mountains, Coronado National Forest. This mountain range, encompassing 307,700 acres of Forest land in extreme southwest Arizona attracts 40 of the 109 species listed in this report. Most of these are non-game birds and are of a peripheral classification. The majority of these birds have been observed in the Cave Creek area; no doubt other areas of riparian habitat within the Chiricahua also have these same species. These, however, represent only a small fraction of the indigenous wildlife, plants and insects which attract lookers and students, both professional and amateur, from all over the United States and even from foreign countries. The Cave Creek, Rucker Canyon and Chiricahua National Monument areas are all accessible by vehicular travel. However, most of this area has been bypassed by modern civilization, and is a quiet retreat pierced only by an occasional dirt road or trail.

This rugged area encompasses biotic communities from the Upper Sonoran to the Canadian Life Zone. The Chiricahuas are "ecological islands" in the desert. The diversity of elevation, exposure, slope, and moisture accounts for the wide variety of plant and animal life. On the hot, dry, south slopes are such plants as yucca, agave, and cacti. Cooler north and east slopes provide pigmy forest of Chihuahua pine, pinon pine, and scrub oak. Shaded canyon bottoms support dense stands of Arizona cypress, alligator juniper, sycamore, cottonwood, and chokecherry. Exposed ridges at higher elevations support chaparral plants, such as pointleaf manzanita, skunkbrush, and buckthorn, while moist mountain tops have small stands of Douglas fir, ponderosa pine, and quaking aspen.

The abundance of wildlife and variety of plant life make this ecological area very important from the standpoint of multiple use management considerations.

2. Peloncillo Mountains, Coronado National Forest. This range of mountains is located in the extreme southwest corner of New Mexico and extreme south east corner of Arizona. It is another of the Southwest's "ecological island" communities with a diversity of plant and animal species. Refer to the Chiricahua Mountains for a description of the biotic communities present. A 89,467-acre managed by the Douglas Ranger District, contains 37 of the 109 reported species listed in this report. Most of these species are non-game birds. The general area of known existence for these species seems to be in the Guadalupe Canyon portion of this range. Much of this area is on private of BLM lands; however, the inaccessible area and upper portions of the canyons are on Forest administered lands. Primary protection is the remoteness of the area from any main highway route, or population center. Very few dirt roads are found in this area.

3. Santa Rita Mountains, Coronado National Forest. The Santa Rita Ranger District supervises management with a 207,000 acre area in which these mountains are included. This mountain range is another of the Southwest's "ecological islands." It is surrounded by a sea of desert creating a rare combination of climate, moisture, and elevation. These, in turn, produce habitat conditions for vegetation and wildlife uncommon in other parts of the United States. Refer to the Chiricahua Mountains for a description of the biotic communities common in these similar southwest mountains.

36 of the 109 species listed in this report are found in these mountains. Most of these are birds and are found in Madera Canyon which is located approximately 40 miles south of Tucson. This area is receiving multiple use management for the protection of these species. Nearby Sonoita Creek has also numerous bird species which are being preserved by the purchase of 320 acres of land by the Tucson, Arizona Audubon Society and The Nature Conservancy.

4. Huachuca Mountains, Coronado National Forest. This area of special interest is located southeast of the Santa Rita Mountains and also is an ecological area of diverse biotic communities similar to those described in the Chiricahua Mountains. It encompasses a land area of about 147,500 acres. Fort Huachuca Military reservation adjoins the Forest boundary to the north and east. The Coronado National Monument, about 2,8000 acres, lies to the southeast between the Forest and the Mexican border. The southern boundary of this Forest unit is the Mexican border.

As a result of this area's closeness to Mexico, it is an important summer breeding area for many tropical species of birds. While the majority of these species are fairly abundant within Central America, their existence within the United States is threatened by loss of available nesting habitat, a factor that could reduce their overall population in the future. The Ramsey Canyon area on the eastern side of the range is widely known to bird students as the Hummingbird Capitol of the United States. Visitors come from far and wide to see the more than a dozen species of hummingbirds which have been recorded at feeders in the area. Many other kinds of both native and peripheral birds are found in this area.

Approximately 40 of the 109 listed species are found in this mountain range. The area of species distribution appears to be primarily in the Miller Peak - Carr Peak portion of this range. Further studies on species distribution and population estimates need to be made prior to any land status recommendations in regard to future protection of these species.

5. Lower Gila Valley, Gila National Forest. This area comprises the portion of the lower Gila River lying between Gila and Redrock in southwest New Mexico, a distance of about 21 river miles. The vegetation of this lowland stream area winding among the pinon juniper and oak foothills, consists of riparian vegetation, primarily cottonwood, sycamore, and willow groves.

Most of the species present are non-game birds. These birds were at one time most numerous between Cliff and Gila; however, since the destruction of sycamore and cottonwood trees to make way for agricultural needs, these birds have been restricted to Forest lands.

Dr. Dale Zimmerman of Western New Mexico University stated that he receives many letters every year from persons all over the United States interested in planning a trip to the Silver City area in hopes of sighting one of these rare birds.

It is possible that the riparian area within the Forest boundary encompassing about 4,000 acres below the town of Gila and above Redrock, on the Gila River, could have as its number one use, the protection of habitat for the perpetuation of these bird species. Before any land exchange or additional use takes place in this area, it would be well to consider the need of these wildlife species.

6. Other areas of ecological importance, involving a lesser number of rare and endangered species than those areas already described, are listed on the map, but discussed under the appropriate species.

APPENDIX III

WILDLIFE HABITAT COORDINATION MEASURES
REGION 3

I. COORDINATION WITH TIMBER MANAGEMENT

1. Proper location and construction of timber roads and skid trails to eliminate or minimize siltation of streams.
2. Reservation, in connection with tree planting and regeneration, of sufficient natural openings, access ways, and brush areas to meet game needs; leaving unplanted strips between plantations and existing timber stands.
3. Planting or reservation of natural groups of conifers for wildlife shelter.
4. Reservation and release of fruit-bearing trees and shrubs.
5. Retention of an adequate number of den and roost trees.
6. Creation of small openings by harvest cutting in dense timber stands.
7. Planning for use of timber harvesting roads so that they also serve sportsmen needs.
8. Management of streamside and lakeshore borders to preserve cover conditions for animals associated with water, such as waterfowl, beaver, and fish. This will include:
 - a. Retention of natural areas along streams and lakeshores where no cutting will be permitted.
 - b. Provisions to prevent leaving of debris in the stream and on the banks in areas where light cutting along streams will not be damaging.
 - c. Favoring aspen reproduction in important beaver and deer habitats.
 - d. Location of logging roads away from live streams to prevent destruction of the natural stream channel.
 - e. Prohibition of log landings in live streams.
 - f. Bridging of water courses where practical on log haul roads.

- g. Limiting number of stream crossing in logging operations.
 - h. Elimination to the greatest possible extent of tree-felling into stream channels or of dragging trees along or across them.
9. Prevention of stream pollution by sawmill wastes.
 10. Adjustment of slash disposal plans to cover requirements of local game species.
 11. Prevention of log skidding across meadows, along streambanks, or through needed food, escape, nesting, or roosting cover.
 12. Leaving some slash piles unburned along valley edges to provide escape cover for small game.
 13. Reservation from cutting of small areas around seeps and stringer meadows and in cutover areas that immediately adjoin these reserves leave occasional slash piles.
 14. Give consideration wherever practical to short cutting cycles in small clearcut blocks.
 15. Promote increased aspen sales in important deer areas.
 16. Withhold from planting special areas needed for special game food and cover plantings.
 17. In spraying to kill deciduous growth and release coniferous timber species, leave enough hardwoods in strips or patches to provide a good crop of mast for wildlife.
 18. In important spawning areas where timber operations might conflict, suspend logging during spawning seasons to avoid interference with upstream movement, eggs, and young.
 19. Scatter the location of small timber sales to break up large areas of a single age class.
 20. In larger clear-cuttings, leave uncut small scattered (1/2-acre) plots for shelter.
 21. Seed skidways, roadsides, and landings on sale areas. Include in seeding mixtures desirable game food species which will grow in the area.
 22. Conduct slash burning in such a way and at such times that ash in injurious quantities will not enter fishing streams or lakes.

23. Vary marking practices when normal marking rules do not create sufficient openings in the canopy.
24. In timber stand improvement work, use caution in applying sodium arsenate, or other chemicals toxic to wildlife -- use only in a manner which will not endanger wildlife.

II. COORDINATION WITH RANGE MANAGEMENT

1. Give forage allowance for game in range surveys and plans.
2. Manage grazing of permitted livestock to give maximum protection of key game ranges and maximum reservation of food for game on these areas.
3. In placing salt on the range, big game needs and the possibility of obtaining better distribution of big game should be given consideration.
4. Give consideration to seeding of depleted grass ranges to lessen the use of shrubs by livestock.
5. Reduce shrub use by livestock through moderate grazing for shorter periods, particularly short fall seasons.
6. Installation of escape ramps for small game from livestock watering tanks.
7. Inclusion of legumes, browse, and other important game foods in range reseeding mixtures where proven sound through research studies; development of browse seeding equipment for livestock and game range.
8. Leave essential browse for game in reseeding projects which involve some brush removal.
9. Give consideration to deferment of spring grazing by domestic livestock in important upland game bird nesting areas until young grouse are no longer dependent on green feed.
10. Close supervision, fencing, or elimination when practical of livestock driveways across game winter ranges to insure maximum reservation of winter feed for game.
11. Consider game needs and consult with State Game Department before initiating brush control projects on winter game ranges.

12. Before approval of a change in kind of livestock, weigh carefully the possible effects on wildlife species.
13. Whenever practical, range management plans will provide for reservation of forage at heavily used hunting and fishing camp areas for recreational pack and saddle stock.
14. No range improvements will be built which will tend to concentrate or encourage use of key game ranges by domestic livestock.
15. Give consideration in locating stock watering improvements for livestock to places where they will serve wildlife needs as well.
16. Fencing of springs at water developments provides excellent cover and nesting for upland birds and needs to be given consideration when developments are installed.
17. Careful consideration of possible ecological effects of coyote and other predators in control programs.
18. Where there is a direct known competition for forage between domestic stock and big game, endeavor through research and study to arrive at a reasonable balance in use -- see Category II Handbook - Guides for Determining Estimated Grazing Capacity.

III. COORDINATION WITH ENGINEERING

1. In road construction, keep channel changes to a minimum.
2. Limit the borrow from gravel bars to those above water level. Borrow pits below high water stage should be leveled and provided with drainage outlets to avoid trapping fish when high water recedes.
3. Install culverts in fishing streams at the grade of the stream. Avoid drop-offs at outlets which would be impossible for fish to negotiate. Lay culverts somewhat below streambed level where necessary to accomplish this.
4. Eliminate or minimize use of heavy equipment in streambeds to a minimum.
5. Consider hunter and fisherman use in planning for all roads and trails.
6. In locating roads, avoid streambanks, meadows, water courses, and other areas of important wildlife habitat insofar as practicable.

7. Insofar as practicable, cut and fill slopes should be vegetated with suitable wildlife foods.
8. In road construction, leave fringe of timber and bursh along the stream to provide shade and bank protection.
9. Leave overhanging brush, trees, banks, and rocks to provide hiding places for fish.
10. Keep large quantities of construction debris out of streams.
11. Provide for adequate spreading of drainage water from roads where necessary to prevent silting pollution of fish habitat.
12. Be alert to possibility of designing road fills to serve as dams. Since this will ordinarily require work that cannot be financed from regular road funds, be alert for opportunities for cooperative financing of any extra work required.

IV. COORDINATION WITH WATERSHED MANAGEMENT

1. Use browse and legumes to the greatest possible extent in erosion control plantings.
2. Include willow plantings and other suitable shrub and tree species in bank stabilization work.
3. Work with Fish and Game Departments to introduce beaver into suitable unoccupied habitat; and devise methods for adequate harvesting of beaver where populations have reached the carrying capacity of their food supply.
4. Coordinate municipal watershed plans and big game harvesting plans in order to provide for sound big game management on municipal watershed areas.
5. Give adequate consideration to the protection and improvement of wildlife habitat in any program involving water impoundment.
6. Give adequate consideration to safeguarding or betterment of aquatic wildlife habitat in all structural improvements for altering stream courses, streambank stabilization, channel and gully control, involving such measures as revetments, jetties, riprapping, grade stabilizers, diversions, etc.
7. In gully and other erosion control plantings, use of fruit-bearing and thicket-forming species which will furnish food and cover for

game is desirable. Also, in wildlife plantings, efforts will be directed toward satisfaction of watershed objectives.

V. COORDINATION WITH RECREATION

1. In areas where unrestricted cross-country use of 4-wheel drive vehicles by sportsmen could result in accelerated erosion, designate travel routes and restrict vehicles to these routes.
2. Locate hunting and fishing camps so that stream pollution or other damage to wildlife habitat is prevented or held to a minimum.
3. Wherever practical, horses used at hunting camps located within game winter ranges will be corralled and fed when not in use.
4. Give consideration to restricting camping and grazing of pack and saddle stock at some of the more heavily used fishing areas. The terrain immediately adjacent to such areas may need to be closed to grazing.
5. Consider restricting speed boating in some waters especially suitable for fishing.
6. Consider camping needs of hunters and fishermen when selecting areas for public campground development.
7. Through sportsmen's clubs and other organizations, develop programs of cooperative hunter and fisherman camp cleanup, sanitation, and fire prevention.
8. Consider the needs of non-commercial hunters and fishermen for camp-site areas before issuing special use camp or resort permits to commercial outfitters or other commercial users.

VI. COORDINATION WITH SPECIAL LAND USES

1. Consider need for fish screens at headgates of ditches.
2. Maintenance of adequate minimum pool levels in artificial reservoirs.
3. Provision for minimum and maximum rates of discharge from impoundments.
4. Provide for a reasonable vegetative cover on ditchbanks.

5. Consider needs of wildlife for land involved when acting on applications for agricultural use of land.
6. In all occupancy permits, provide for protection of wildlife and its habitat, including the control of organic and inorganic pollution.
7. Give consideration to plantings along power lines and similar clearings which will produce game food and at the same time reduce cost of periodic clearing.

DIRECT WILDLIFE HABITAT IMPROVEMENT MEASURES

1. Stream and lake improvement to create more favorable conditions for fish life:
 - a. Streambank stabilization.
 - b. Providing shade by planting along streams.
 - c. Small check dams and deflectors to improve shelter and pool conditions.
 - d. Providing gravel in lakes.
 - e. Provide cover in lakes by sinking brush piles.
 - f. Removal of undesirable vegetation from ponds.
 - g. Pond fertilization.
 - h. Raising of water levels in lakes to prevent winter loss.
2. Building of flow maintenance dams.
3. Diverting water to unstable natural lakes.
4. Building of fishing lakes.
5. Building of ponds and marsh areas for waterfowl.
6. Building of water places, such as ponds, spring developments, "guzzlers," in arid sections to provide drinking water for wildlife.
7. Making food and cover plantings:
 - a. Seed species suitable for wildlife in control projects.
 - b. Legumes and grasses in forest and other openings.
 - c. Browse on big game ranges.
 - d. Willows and other riparian tree species for streambank stabilization and shade.
 - e. Fruit and mast production species in upland bird areas.

8. Cultivation and fertilization of food plots.
9. Opening up dense bursh fields to provide access by game and also variety of forage plants.
10. Thining of dense timber stands.
11. Building of hunter and fisherman access roads, providing parking areas.
12. Creation and maintenance of small forest openings.
13. Pruning and release of fruit trees and grape vines.
14. Development of salt grounds.
15. Cutting browse species to stimulate growth.
16. Prescribed burning for game habitat betterment.
17. Discing of openings.
18. Fencing of key food and nesting areas.
19. Fencing of stream bottoms.

